

# THE BLUE MOON OBSERVER

## JUNE, 2017

The June general meeting of DPAS will be held June 6, 2017 at 7 PM at the Ray & Ruthie Stonecipher Astronomy Center. A video from the Hawking series, "Where did the Universe Come From:" will be shown and discussed. Dave Lenius will present the Astronomy Basics program. A brief business meeting will be held to elect our officers.



### Door Peninsula Astronomical Society

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[www.doorastronomy.org](http://www.doorastronomy.org)

#### *Notes from our meeting of May 2, 2017*

In the absence of Dave Udell, our president, the assembled 12 members and guests were welcomed by vice president Tom Minahan. He reminded us of viewing night on May 27, and announced that the building and grounds cleanup, coordinated with Barbara Henkelmann and her Master Gardeners group, would take place on Friday, May 19.

Gary Henkelmann then gave a report on the NCRAL annual meeting at the Eagle Bluff Environmental Center in Minnesota hosted by the Rochester Astronomical Society. One of the items he observed was an inflatable planetarium, larger and quarter than ours, but without a state of the art projection system.

One of the talks was about spectroscopy as the focus of many amateur astronomers, delivered by Dr Robert Mutel. He described a system of spectroscopy instruments

which he had mounted on his filter wheel. Gary went on to explain how spectroscopy is used to measure redshift and thus the speed at which celestial objects are moving away from our solar system. Demonstration, however, was precluded when the skies clouded up. [We're all familiar with that!] Carl Wenning presented his Astronomy Bucket List. Amanda Marduca reported on the History and Divisiveness of the Mount Wilson Telescope. Subtle Variations in Variable Stars was presented by Steve Kawaller, followed by Russ Durkee and the Decade of Research. Karl Young delivered a talk on the Cosmic Background Radiation. Jennifer Anderson demonstrated making craters by dropping objects from much higher than the demos by our own Tom Minahan.

Gary then described an alternative to a planetarium: a large concave screen mounted with the focus

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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, a weather station housed in the observatory with current readings shown on our web site:

[www.doorastronomy.org](http://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 an object through the same binocular.

The Ray & Ruthie Stonecipher Astronomy Center, shown on the right at the top of this page, 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 available 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. Set your GPS to 2200 Utah.

## Note!

## The July General Meeting will be on July 11

instead of the first Tuesday  
which falls on the fourth.

Enjoy your Independence Day!

### DPAS News

A new computer system was installed in the Leif Everson Observatory on 5/31/2017.

Building and grounds cleanup and planting and driveway maintenance was done on May 19 despite a number of youngsters who were present at the same time, part of a group brought in for a learning experience, not to help with the campus project.

Plans are still being finalized for the Solar Eclipse field trip.

Jacque Axland is chairperson of the NCRAL 2018 planning committee. Some speakers have already been confirmed. Target for budget completion is the end of September, 2017. The event will be held the weekend of May 4, 2018. We have support from the organizer of NCRAL 2017 and have "met" with him by telephone, and from the immediate past president of NCRAL who was also a former member of DPAS. The North Central Region, Astronomical League includes North Dakota, South Dakota, Minnesota, Iowa, Illinois, and Wisconsin.

Officers will be elected at the June 6 general meeting. Current

officers are listed under **DPAS Board** on page 3.

DPAS is happy to welcome new members over the past 12 months:

Al Curtis & Jan Livingston  
Charlynn Hansen &  
Richard Girod  
Christopher Olson &  
Steffanie Stafford  
Sears Carpenter and  
family  
Dennis & Constance  
Sundin  
Linda NicholSEN  
Michael Whitman  
Kevin Poe  
James & Elizabeth  
Williamson  
Susan Cubar & Tom  
Jordan  
Kate Meredith & Family  
Thomas & Marian Grzeslo  
Joseph & Anne Bohne  
Timothy Murtaugh  
Dan Hubing

Zach Meredith has accepted the position as Summer Intern. We look forward to working with Zach.

The new DPAS website is up and running and is linked to our Facebook page. Thanks, John W. Beck and Jacque Axland!



## DPAS BOARD

David Udell, President  
[president@doorastronomy.org](mailto:president@doorastronomy.org)

Thomas Minahan, Vice President and Board Secretary

Susan Basten, Secretary, Treasurer and Membership Chairperson  
[treasurer@doorastronomy.org](mailto:treasurer@doorastronomy.org)

John J. Beck, Immediate Past President and Editor  
[editor@doorastronomy.org](mailto:editor@doorastronomy.org)

John W. Beck, Webmaster

Gary Henkelmann, ALCOR\*

Jim Maki, Curator

Mike Egan, David Lenius, and Jacque Axland, Members at Large

Ray Stonecipher, in spirit

\*ALCOR is the acronym for Astronomical League Correspondent.

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 scheduled for 4 PM on Monday, 8 days prior to the following general meeting, at the Astronomy Center.

## *meeting notes cont. from p. 1*

directed horizontally, so that an audience seated or standing could look at the “dome” of the sky by looking horizontally rather than sitting on the floor and looking up. This equipment is used in Flagstaff, AZ.

Gary’s report was followed by the main program of the evening, “How, on Earth, do we Measure the Universe Without Leaving the Planet?” presented by Steve Ransom-Jones. A most welcome topic because we are often asked, “How do we know how far away those objects are?” especially on viewing nights. He mentioned that time, distance, analytics, and information technology are all involved.

He recounted the story of Eratosthenes who used a well, a shadow, an earth distance and math to calculate the diameter of Earth around 200 BC. Then Aristarchus of Samos who used an eclipse to determine the diameter of the moon.

Next was the use of parallax and its limitations in determining celestial distances. This was cleverly demonstrated using letters on the screen and an intervening object.

He then referred to the HR Diagram and how the inverse square law along with the color temperature of stars could be used to determine distances.

Next were the Cepheid variable stars and the relationship between period and luminosity.

He described how as hydrogen fusion gives way to helium fusion, the star expands and contracts its radius and brightness varies.

Steve then explained how the emission lines of hydrogen allow their use as a reference in measuring the Doppler effect

Tom Minahan told a joke, then we headed to the table where Barb Minahan had provided caramel-stuffed brownies (!), snickerdoodles, and lemon bars. Yum! Juices were also served.

Tom then discussed the use of binoculars as the Astronomy Basics topic and listed his “Top Ten” binocular targets in the night sky:

- The Moon
- Jupiter and its Galilean moons
- Saturn
- Mizar
- Albireo
- The Orion Nebula
- The Andromeda Galaxy
- The Double Cluster in Perseus
- The Dumbbell Nebula.

A full and fun evening indeed!

John J. Beck





### Astronomy Quiz

1. How far away is the large Magellanic Cloud?
2. Does Jupiter have a magnetic field?
3. Why did William Pickering upset with Percival Lowell?
4. Is Stephan's Quintet a musical group?
5. In which constellation is the Vernal Equinox?
6. Which well known star is a Yellow Dwarf?
7. In which constellation is the Butterfly Cluster?
8. Which terrestrial planet has two captured asteroid as moons?
9. Where is Utopia Planitia?
10. A meteorite made of pyroxene comes from where?

(Submitted by the late Ray Stonecipher in July of 2012.)

### DPAS Scholarships

The 2017 recipients of the Door Peninsula Astronomical Society Scholarship are:

- Yunjeong Lee from Sevastopol School
- Hanna Mallien from Southern Door High School
- Blaze Woldt from Sturgeon Bay High School.

These were presented at their respective schools in May and June.

### IDA Dark Sky Park Designation

Watch for announcements regarding a dedication of Newport State Park as an IDA Dark Skies Park, expected to happen this month.

### Viewing Nights

June—none\*

July—none\*

August 19 at Whitefish Dunes State park

September 23

October 21

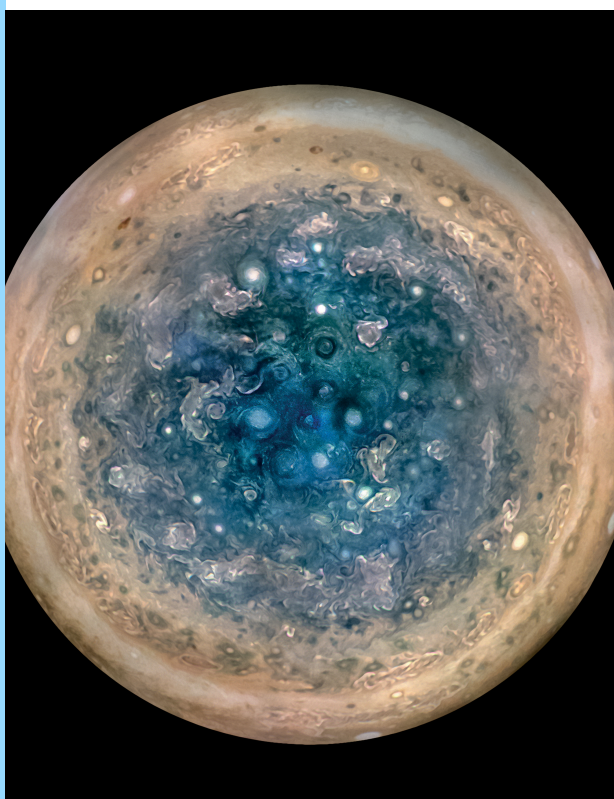
November 28

December 16

\*Except for a viewing night to follow a Birch Creek performance, viewing is not scheduled in June and July because it gets dark so late.

### Telescope Loaner Program

The libraries continue to offer the telescopes, two in Sturgeon Bay and two in Sister Bay, to be checked out. For the solar eclipse, DPAS has ordered solar filters for those telescopes and will make them safe by removing the finder scopes.



This image shows Jupiter's south pole, as seen by NASA's Juno spacecraft from an altitude of 32,000 miles (52,000 kilometers). The oval features are cyclones, up to 600 miles (1,000 kilometers) in diameter. Multiple images taken with the JunoCam instrument on three separate orbits were combined to show all areas in daylight, enhanced color, and stereographic projection.

Credits: NASA/JPL-Caltech/SwRI/MSSS/Betsy Asher Hall/Gervasio Robles



### Poetry Corner

"This is for June, and all the summers it brings  
For the chiming of the church bells... that sing  
In songs of matrimony o'er top hats and lace  
'Fore June passes torch, to July's scarlet face

And the trees in full jacket, leaves forest green  
The last pink of magnolia, can still yet be seen  
There's a breeze in the air, that carries a scent  
Sweet rose and honeysuckle, in efflorescence

Nights still cast a chill, but June has its motives  
An evening gift for all those amorously devoted  
To feel the magic of love whilst under the moon  
Makes one thankful, there be the month of June."

- Frank James Ryan, *June*

## Saturn at Opposition

by Tom Minahan

If you have looked at the night sky anytime this spring, you may have noticed a bright "star" rising in the east after the Sun has set. This is the ringed planet Saturn. Its current location in the heavens is a bit west of the constellation Sagittarius, the Teapot. Because Saturn moves relatively slowly across the background of stars from night to night, it will be in this vicinity well into autumn. On June 15, Saturn will be at opposition. Opposition is when a superior planet is closest to Earth in its orbit; when the Sun, Earth and the planet are all lined up in that order. A planet is superior to another if its orbit is outside that of the other.

Viewing of a superior planet is naturally best when it is nearest the Earth: its face is fully illuminated by the Sun, it is brighter than any other time of the year and is visible all night long. A medium-sized or larger telescope, magnifying 30x power or greater, will allow you to see Saturn's rings and few of its brightest moons. Because the plane of the rings is tilted 27° from the ecliptic (Earth is on the ecliptic plane and the planets all orbit close to it) the extent of their collective visible face varies as Saturn moves through its long year. 1 Saturn orbit = 29.46 Earth years. The rings were edge on and essentially invisible in 2009 but this year they will be prominent and at full tilt on October 17.

The figure shows how Saturn will look when viewed through a small telescope and a larger one on a still night. If you can see the dark Cassini

division that splits the system into the outer A ring and the inner B ring, then you have a good view! Like Jupiter, Saturn displays banded cloud tops, but they are more muted because there is more high-altitude haze in its upper atmosphere. You will need a telescope at least 6" in aperture to make out the bright Equatorial Zone, the darker North Equatorial Belt and the dusky North Polar Region. A yellow-pass filter will usually sharpen Saturn's image; a light green filter may improve contrast in the planet's belt and zones. Also look for the shadow of the rings on the globe and the shadow of the globe on the rings in back.

The rings consist of countless small particles ranging in size from a micrometer up to a meter. The particles are made almost entirely of water ice with trace amounts of rocky material. The rings span 300,000 kilometers but their thickness is only 100 meters or so thick on average, with some large variations. A standard piece of US writing paper enlarged to match the span of the rings would still be 1000 thicker than Saturn's rings!

Saturn has 62 moons with confirmed orbits, ranging in size from tiny moonlets < 1 kilometer across to colossal Titan, the largest moon in the solar system and larger than Mercury. Six of the moons are visible using a telescope: Titan, Iapetus, Rhea, Dione, Tethys and Enceladus all orbit outside the rings. Titan can usually be seen with a small 60 mm scope, but larger apertures are needed to make out the others.

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### Saturn from page 5

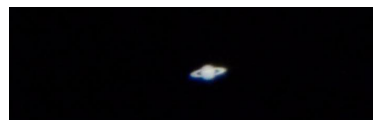
Sky & Telescope has a more detailed guide to viewing Saturn at [skyandtelescope.com](http://skyandtelescope.com). They also have a Saturn's Moons JavaScript utility, which provides a snapshot of the moon positions for any given date and time.

For planets whose orbits are superior to Earth's, their usual eastward movement across the celestial sphere will yearly reverse direction for a time. This *retrograde motion* occurs not because the planet reverses direction in its orbit, which would violate the laws of physics. It occurs because the Earth has a smaller and faster orbit around the Sun; when the Earth overtakes the slower superior planet, the movement of the planet only *appears* to temporarily move in the backward direction. As the Earth quickly swings around the Sun on its inner orbit, its motion relative to the planet will slow and reverse and the planet will again appear to move in its normal, *prograde* motion across the stars. Because of this *pas de deux*, Saturn will loiter near Sagittarius this year well into November.

You probably know that stars twinkle, but planets do not. Stars are so distant they appear as pinpoints of light, even through a telescope. Because all the light arrives from a single point, the path is highly susceptible to atmosphere interference. Its image *scintillates*. The face of a planet as viewed from (relatively) nearby Earth has a much larger *angular diameter* and only heavy atmospheric turbulence will effect the image of Saturn much.

Saturn currently has a man-made moon: The Cassini spacecraft has

been in orbit around the ringed planet since July 2004. In addition to dispatching the Huygens spacecraft to successfully land on the surface of Titan in January 2005, Cassini has sent back loads of high-resolution photos of Saturn's rings, moons and atmosphere and copious amounts of data about the electromagnetic, gravitational and physical/chemical environment of the planet and its moons. Cassini is near the end of its mission, but before it is commanded to plunge into Saturn's atmosphere and BURN UP! on September 15, it will go where no spacecraft has gone before. Cassini is now currently executing 22 planned orbital dives through the narrow gap between the inner rings and the atmosphere of Saturn, only 1900 km wide. Planetary scientists think the gap is clear of orbital debris, but there is a small possibility that the spacecraft could collide with small particles, with a relative velocity of 45 times the speed of a bullet! Let's hope it survives the trip, because Cassini will constantly collect data about our giant ringed friend, right to the bitter end.



This is what Saturn might look like through a 4" telescope depending on many variables.

*The preceding article by Tom Minahan was published in the Peninsula Pulse in May and used by permission of the Peninsula Pulse and [doorcountypulse.com](http://doorcountypulse.com)*

## Astronomy Quiz Answers

1. 170,000 light years
2. Yes. A very powerful one.
3. His photographs of Mars showed no canals.
4. No. It's a disturbed cluster of five galaxies.
5. It's in Pisces.
6. The Sun.
7. It's in Scorpius.
8. Mars
9. It's a huge plain on the planet Mars.
10. Believed to come from Vesta.

