The Blue Moon Observer
September, 2017

The September general meeting of DPAS will be held at 7 PM on September 5 at the Ray & Ruthie Stonecipher Astronomy Center. Program: **A Lite Look @ Gravity** by Tom Minahan. Astronomy Basics: **Telescope Mounts** by Dave Lenius. Refreshments will be served.

Door Peninsula Astronomical Society

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Notes from our Meeting of August 1, 2017

President Gary Henkelmann greeted the 27 members and guests present, outlined the evening's program, thanked ***Mary Grote*** for the array of home-made cookies on the table and announced ***Val Maki*** as the next person up for the donation, spoke of the interview on WDOR at 10:00 next Wednesday on the solar eclipse, spoke of the group heading off to St Peters, MO, the jumping off point for some of our members who'll be traveling south to see the eclipse live, and asked ***Dave Lenius*** to give the code for viewing the eclipse as Dave mans the camera on our telescope, transmitting to the Astronomy Center on 21 August: nightskiesnetwork.ca … our address is DPAS. An exciting day looms!!

Then came me, ***Mike Egan***, showing the 48 slides I had from the 1994 annular eclipse from my garage top in Chicago. They came at us one per every 3 seconds, and asking the members just to "hear" and feel the silence that accompanied the majestic stateliness of the Moon as it passed the Sun. Slides were the technology of the day in 1994 (the year our intern, Zach Meredith, was born!) and they are still beautiful as they carried the pictures of that event. I noted how I turned over my shoulder to see the lady across the street walking her baby in his carriage as the sky darkened a bit – as if there were a passing cloud – and never even glancing toward the sky to witness a different passage. Our on-site folks will witness the whole Sun blocked out, and the day turning to night, with stars and planets visible! ***Tom Minahan*** had distributed the appropriate eyewear to watching the Moon and the Sun do their thing, and I noted that the Moon and Sun would be their usual size without the telescope, but still beautiful and majestic!

Steve Ransom-Jones was next on deck with his excellent presentation on the Hertzsprung-Russell diagram, buttressed with his remarkable non-accent which lent class and

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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

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.

Meeting notes from page 1

intelligence to the talk, a diagram pioneered independently by Elnar Hertzsprung and Henry Norris Russell which linked luminosity as a function of temperature for stars. Most stars are within the Main Sequence: the band that flows from the cool red stars on the lower right of the diagram to the hot and bright blue stars on the upper left, with outliers of giant stars and supergiants and of white dwarfs. Steve gave us the details of the Kelvin scale: from absolute zero where all molecular movement stops to many thousands of degrees, and with our Sun having a 5200 degree range (relatively cool) to the 60k temperature of Rigel. Rigel, a blue star and located in the Orion galaxy, is a supergiant and positioned alongside of Aldebaran and Betegeuse, both red supergiants (which may have already gone nova). He noted that on the main sequence, smaller red stars burn slower and so last longer than the big blues. Our own Sun, a G-star, may jump one day off the main sequence and become a red giant, on its way toward its demise as a white dwarf. He also, never losing his accent, sequenced for us the burning of the stars: from hydrogen to helium and so on up the chart to iron. Iron doesn't produce energy, it takes it away. And so it becomes the dead end for an ordinary star. He described the transit of iron to all that lies behind iron – all the silver and gold, for instance, and that is created in the titanic explosions that are stars going nova and supernova, with temperatures created in the collapse of these stars when everything else is burned up. An excellent way to understand and to relate the colors of luminosity to temperature, to the life of a star.

Then came the break: cookies freshly made by ***Mary Grode*** of excellent ginger snaps, chewy chocolate chip cookies and squares of chocolate brownies. Delicious, and thank you, Mary.

We returned to a presentation by Zach Meredith, the extension of a paper he is writing for his professor at EauClaire. He titled his paper *"What's Wrong with Big Stars?"*

He described the exoplanets identified today: 3500 of them, all of them like our planets, but not around our Sun! He described the prime processes used to spot the planets. The first, less frequently used apparently, was watching the "wobble" in the star's orbit as the planet tugged its star on one side and then the other as it orbited it. A planet the size of Jupiter creates a bigger wobble than one the size of the Earth. The second measures the drop in light that the star puts out as the planet passes over it: transphotometry, it is called. Measured against stars the size of the sun, at 1 solar mass, 15 masses and 59 masses. (I missed much of the detail here: the light was too feeble for me to see what I wanted to write, and I scribbled over too many of the salient facts – I apologize, Zach!

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DPAS BOARD

Gary Henkelmann, President
president@doorastronomy.org

Thomas Minahan, Vice President, Outreach Coordinator, and Board Secretary

Susan Basten, Secretary, Treasurer , ALCOR, and Membership Chairperson
treasurer@doorastronomy.org

John J. Beck, Past President and Editor
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 scheduled for 7 PM on Monday, 8 days prior to the following general meeting, at the Astronomy Center. Members of DPAS are invited to attend Board meetings.

Meeting notes from page 2
Especially with the mathematical equations that were offered.) Clearly, as a photo he showed demonstrated perfectly, the larger the star the planet transits, the less the relative dip in light shows, and the probability that we'd be able to spot it at the distances we are working at diminishes. So the conclusions we come to with regard to the really big stars is either that they don't have planets, or that we can't see them. The most planets found to date are between the size of Earth and Jupiter and are orbiting A stars.

Mike Egan

The Colors of the Universe

Our expectation of what we will see through a telescope sometimes doesn't square with our actual experience, and disappointment results.
So it was with my first telescope experience.
A novice, I bought a rather inexpensive Newtonian, and set it up on the roof of an apartment house in the Bronx and – first light for the scope and for me – focused on the deep sky on a moonless night.
I'd seen all the wonderful pictures of star clusters and galaxies and nebulae, with their brilliant blues and reds and bright whites, and could hardly wait to see them for myself. Instead, I saw many small bright spots (stars), with touches of gray-green in the "clouds" of the nebulae, and, in a few places, the palest of almost-imagined color. What, I wondered, was wrong with my telescope?
In time, and with a much better telescope, I found reddish Mars and red and blue supergiant stars, but nothing quite like the pictures in *Astronomy* magazine. In still more time, I understood that, as Shakespeare wrote: "The fault, dear Brutus, is not in our stars, but in ourselves …", specifically, in our wonderful eyes, that we see what we see.
Our eyes have color-sensitive cones in the retina, as well as the light-sensitive rods. Color, of course, is a function of the wave-length of light we are picking up, and the spectrum we are sensitive to is rather narrow. Large enough, of course, to show us the beauty that surrounds us with our blue skies, red sunsets, green grass and trees and brilliant flowers, but the light that comes to our eyes from most stars and stellar phenomena like the nebulae, is just too feeble to trigger color sensation in our eyes. Planets are a lot closer, of course, but even they are small objects in most telescopes. Stars are just so far away that only the most massive among them, and only if they are at a reasonable distance (like within a couple of thousand light years "reasonable"!), will be captured by our unaided eyes.
There's another factor, too, and that's the time color has to work its magic on our sensitive cones. This relates to more than sky-gazing: it's the basis for movies, too. From the time the retina picks up a photon of light and transfers the information to our brains, a split second goes by.

Astronomy Quiz

1. Is Venus the morning star or the evening star in September this year, and through which constellation does it travel?
2. Who is the African-American physicist and mathematician who turned 99 on August 26 of this year and who was so skilled with math that NASA consulted this person to verify the results obtained by their computers?
3. An eyepiece with a focal length of 25 and an apparent field of view of 64 degrees is placed in a telescope with a focal length of 1000 mm. What is the approximate actual field of view with this setup?
4. What is Einstein's cross?

Solar Eclipse Adventure
Clockwise, Clair Minnahan in the chaise lounge, Susan Basten with a crowd as usual, Elsie Lindgren at the eyepiece of my Renaissance, John W. with his camera, and a shot of totality which I obtained hand-held with my 75-300 zoom at 300 mm.

Poetry Corner

Dachshunds

The Dachshund leads a quiet life
Not far above the ground;

He takes an elongated wife,
They travel all around.

They leave the lighted metropole;
Nor turn to look behind
Upon the headlands of the soul,
The tundras of the mind.

They climb together through the dusk
To ask the Lost-and-Found
For information on the stars
Not far above the ground.

The Dachshunds seem to journey on:
And following them, I
Take up my monocle, the Moon,
And gaze into the sky.

Pursuing them with comic art
Beyond the cosmic goal,
I see the whole within the part,
The part within the whole;

See planets wheeling overhead,
Mysterious and slow,
While morning buckles on his red,
And on the Dachshunds go

by William Jay Smith

Fast, but not instantly. The old film movies were based on that brief retention-transmittal time. About 16 frames a second, and we'd see motion. So, simply, our eyes don't hold on to a stimulus long enough for it to register. Imagine what it'd be like if they didn't let go as fast as they do! All we'd see is a blur of images, one flowing into the next.

That's why photography works so beautifully in the pictures of the sky we frequently see. I can attach a film camera to the back of my telescope, set the aperture to wide open and let light from the distant deep-sky accumulate for minutes, if need be. Faint color "builds up" on the film for as long as the shutter is open. Of course, there's another situation that has to be factored in: the earth we are standing on is moving while the shutter is open! And it is moving not only toward the east – our rotation on the Earth's axis -- but also moving with the Earth in its orbit around the Sun. This second element doesn't really matter much because the objects we are photographing are so incredibly far away the distance travelled barely matters. But the rotation of the Earth does matter, and many larger telescopes (such as my 8" SCT Celestron) compensate for the rotation with a little motor that drives the scope in the opposite direction from the rotation. It's neat and the result is a clear and un-blurry picture. Sometimes.

While we are on the topic: in addition to the limits imposed by our eyes, it turns out that many commercial pictures of the deep sky are not true color photos at all, but are photos to which colors are assigned based on the brightness of the object. The results are invariably beautiful, but not quite real!

So what to do? The "fixes" to see the colors out there may require an investment you are not in a mood to make. But there are objects to look at that do reveal some natural color, and maybe living with the limits imposed is the right answer.

For instance, Mars, mentioned above, is distinctly ruddy due to its iron-rich surface; Saturn is a light salmon color to my eyes, and its true magnificence as a viewing object is seeing her rings; Neptune and Uranus, difficult to find, are a wonderful blue-green; really big and bright stars show colors based on temperature. Red is not the hottest star, however: but it is the color of a Red Giant, a star nearing its crescendo in the final struggle of the expansive effect of heat in its nuclear furnace and the power of gravity. In the end, gravity will win, and the star will collapse and then cataclysmically explode, possibly as a supernova, creating in the process all the elements above iron and scattering its remains to the cosmos to be reassembled in other newborn stars (and in our bodies and in every terrestrial thing we see and touch and taste and smell!) .

Two such red stars readily come to mind: Betelgeuse (the upper left hand of Orion the Hunter, 430 light years distant, and 800 times the diameter of our Sun!) and

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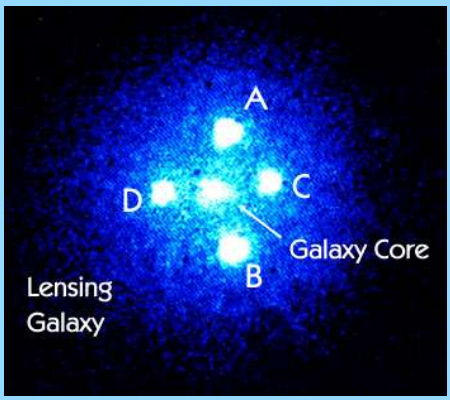
Astronomy Quiz Answers

1. Venus is still our morning star in September. It left Gemini in August and moves from Cancer to Leo this month.
2. Katherine Johnson
3. True field = apparent field/ magnification = 64/40 = 1.6 degrees or just over 3 moon diameters.
4. Einstein's cross is 4 points of light caused by gravitational lensing of a supernova by a galaxy.



http://cr4.globalspec.com

Colors of the Universe from page 5

Aldebaran (the red eye of Taurus, the bull, 65 light years distant, 360 times the Sun's luminosity and 45 times its diameter), both easy to find with the naked eye.

The really hot stars *are* blue! In the same neighborhood as the two red giants is magnificent Rigel, a beast of a star 50,000 times the luminosity of our Sun and 30 times its diameter, a blue super giant 770 light years away. It is in the lower right corner of Orion. When it begins its death throes some day, it too will become a red giant and it will be enormous. Another couple of stars, an optical double, are found as the head of Cygnus the Swan. The double's name is Albireo, and one of the stars is orange in color, the other blue. Sort of like a traffic light in the sky. You'd need at least binocs for this one, but its beauty is worth the extra effort.

Some night, when the Astronomical Society is hosting a viewing night, you might like to come up the hill off Utah and seat yourself on an oval and grassy structure we have where you can lie back and look up at the sky. We have binoculars there, and you'll be amazed, if you've never looked at the sky this way before, at the incredible number of stars you'll see. Some of which will show a bit of color and others, well, just what I'd call a gray-green, but what more sophisticated views have dubbed a cross between Medium Aquamarine and Pale Turquoise.

Mike Egan

The preceding article by Mike Egan will be published in the Peninsula Pulse in September and is used by permission of the Peninsula Pulse and doorcountypulse.com.w31

DPAS Activities

Welcome to new members David & Patricia Buck.

August 16 @ 5:30 pm: Tom M. & Zach M. presented an eclipse program at Sturgeon Bay Library. **August 17 @ 11 am**: Tom M. & Zach M. presented an eclipse program at Sister Bay Library.
August 21 starting 10 AM: Jim, Dave, Steve and Mike hosted solar viewing including online coverage at the Astronomy Center and Leif Everson Observatory.

Viewing Nights:
September 23
October 21
November 18
December 16

Astronomy Day is being planned for October 14.

Dark Ranger Kevin Poe returns September 15 & 16 for school programs. Public program is at Southern Door Community Auditorium at 2 PM on Saturday, Sept. 16. Boys and Girls Club and public viewing with Kevin will be Saturday evening.