The Blue Moon Observer

July 2019 Volume 21, Number7

Door Peninsula Astronomical Society

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www.doorastronomy.org

The July general meeting of DPAS will be held at 7 PM on Tuesday, July 2, at the Ray & Ruthie Stonecipher Astronomy Center. The 50 year celebration of the first lunar landing will include a movie of Apollo 11. Refreshments will be provided by the John & Elsie Lindgren family. Elections will be held.

Notes from the General Meeting
Door Peninsula Astronomical Society
June 4, 2019 @ 7 pm

Attendance: 19

Announcements by Dave Lenius: 1) Apollo 11 50th Anniversary of the first moon walk Celebration July 20 at the Astronomy Center. 2) We asked for and received in the person of Jim O'Reilly an electrician who can look into and possibly fix some minor problems. 2 exterior lights are out, an outlet is needed in the garage (per the Fire Department) and the weather station connection was accidentally run over by a lawn mower. 3) A volunteer is needed to give a fresh coat of paint to the Gas Giant & Rings model near the entrance at 2200 Utah Street. 4) Board Elections to be held at the July general meeting. Let us know if you would to be on the board. 5) Last month DPAS Scholarships were awarded to 4 deserving High School seniors pursuing an education in the sciences, math or technology - $2000/year for 4 years. 6) Our June 1 viewing night was clouded out but 10 people enjoyed a planetarium Dome show. It's the general consensus that the new Planetarium works as advertised and was a good purchase. We asked members if anyone would like to learn to run the Dome - controlled by an iPad (provided) and intuitive to use.

The DPAS will present Dome shows at the following dates and locations this summer: June 17 @ 1 pm at the Sturgeon Bay Library, July 10 @ 6 pm at the Bailey's Harbor Town Hall/Library, July 15 @ 2 pm on Washington Island,, July 29 @ 6 pm at the Sister Bay Library and July 31 @ 10 am TBD. Telescope instruction and demonstrations will be given: June 18 @ 6 pm at the Sister Bay Library, June 19 @ 6 pm at Bailey's Harbor Town Hall/Library, June 24 @ 6 pm at the Ephraim Town Hall, July 16 @ 7 pm at the Kress Pavilion in Egg Harbor and July 18 @ 6 pm at the Sturgeon Bay Library.

John Beck presented the story of Apollo 10, which did everything Apollo 11 did EXCEPT actually land on the surface of the Moon. Occurred only 7 months after Apollo 7, the first manned Saturn rocket (505) and Apollo mission to space. Crew: commander Tom Stafford, Gene Cernan & John Young. The command module (CM) was nicknamed by the crew Charlie Brown and the lunar module (LM) Snoopy. Additional objectives of the mission: 1) Verify function of LM in the lunar environment, 2) Evaluate mission support performance, and 3) Refine gravity anomalies of the Moon. Not real great computers back then and system failures common, so the

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 16" Ritchey-Cretien telescope on a sophisticated tracking mount controlled by computer, and a new Maksutov-Cassegrain telescope for planetary viewing. A weather station is currently in need of repairs or replacement.

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 Digitalis 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.

Observe the Moon and Beyond:
Apollo 11 at 50
By David Prosper

Saturn is at opposition this month, beckoning to future explorers with its beautiful rings and varied, mysterious moons. The Moon prominently passes Saturn mid-month, just in time for the 50th anniversary of Apollo 11!

Saturn is in opposition on July 9, rising in the east as the Sun sets in the west. It is visible all night, hovering right above the teapot of Sagittarius. Saturn is not nearly as bright as Jupiter, next door in Scorpius, but both giant planets are easily the brightest objects in their constellations, making them easy to identify. A full Moon scrapes by the ringed planet late in the evening of the 15th through the early morning of the 16th. Some observers in South America will even see the Moon occult, or pass in front of, Saturn. Observe how fast the Moon moves in relation to Saturn throughout the night by recording their positions every half hour or so via sketches or photos.

While observing the Saturn-Moon celestial dance the early morning of the 16th, you can also contemplate the 50th anniversary of the launch of the Apollo 11 mission! On June 16, 1969, Apollo 11 blasted off from Cape Canaveral in Florida on a journey of almost a quarter million miles to our nearest celestial neighbor, a mission made possible by the tremendous power of the Saturn V rocket – still the most powerful rocket ever launched. Just a few days later, on July 20, 1969 at 10:56 pm EDT, Neil Armstrong and Buzz Aldrin set foot on the lunar surface and became the first people in history to walk on another world. The astronauts set up equipment including a solar wind sampler, laser ranging retroreflector, and seismometer, and gathered up almost 22 kilograms (48 pounds) of precious lunar rocks and soil samples. After spending less than a day on the Moon's surface, the duo blasted off and returned to the orbiting Columbia Command Module, piloted by Michael Collins. Just a few days later, on July 24, all three astronauts splashed down safely in the Pacific Ocean. You can follow the timeline of the Apollo 11 mission in greater detail at bit.ly/TimelineApollo11 and dig deep into mission history and science on NASA's Apollo History Site: bit.ly/ApolloNASA.

Have you ever wanted to see the flag on the Moon left behind by the Apollo astronauts? While no telescope on Earth is powerful enough to see any items left behind the landing sites, you can discover how much you can observe with the Flag on the Moon handout:

bit.ly/MoonFlag

continued on page 4

DPAS BOARD

John J. Beck, President *pro tem* and Editor
editor@doorastronomy.org

David Lenius, Vice President

Thomas Minahan, Outreach Coordinator

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

Jacque Axland, Membership Chairperson and Recording Secretary of the Board

John W. Beck, Past President and Webmaster

Dennis Sundin, Member at Large

Tom Gwilym, Member at Large

Jim Maki, Member at Large

Steve Ransom-Jones, Member at Large

Ray Stonecipher, in spirit.

Barbara Henkelmann serves as the DPAS Archivist.

Coggin Heeringa serves as acting school coordinator in the absence of that board position.

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 notes from page 1
crew had cue cards with all the major events and T-plus times.

Launch date: May 18, 1969. There were pre-launch glitches at T-minus 8 hours and T-minus 50 minutes; the first was a blown fuse and the other a failed level adjust valve they determined would not cause tolerances to be exceeded. Once the craft reached Earth orbit, they fired their rocket to put them into Translunar Injection: accelerate briefly and coast at >36,000 feet/sec. toward a point in space where the Moon will be when they get there, 73 hours & 22 minutes later. Modules separate and command and lunar modules dock en route. 4 midcourse corrections were allowed but only 1 needed. Modules separate at 100 hours and the LM enters a quite elliptical orbit around the Moon: 13.7 by 219 miles. John Young in the CM was the first human to fly around the Moon solo. Closest approach of the LM to the lunar surface was 47,400 feet. They purposely did not have enough fuel to land and get back to the CM - just to remove any temptation they might have had to beat the crew of Apollo 11! The LM descent stage was jettisoned on the 2nd attempt and caused an immediate loss of control of the return stage with 2 astronauts in it. Stafford regained control within 8 secs. On the ascent back up to the orbiting CM, John Young reported seeing the exterior lights of the LM from 48 miles away.

After LM and CM hookup and the mission's 31st lunar orbit they fired the rocket to go into trans-Earth injection. Earth re-entry and splashdown problem-free. The total length of the flight was 292+ hours, 1 minute 24 seconds longer than planned! Fact: Snoopy the LM was put into a heliocentric orbit after separation from the C\M. Question: Where is Snoopy now? No one knows for sure. NASA stopped trying to track it long ago, but the Faulkes Telescope Project tried to find Snoopy in 2011 but no luck. Recently, a fellow of the Royal Astronomical Society announced he and his colleagues located Snoopy using radar data with 98% certainty. For more information, google "Apollo 10 where is Snoopy?"

Refreshments provided by Ann ♪♪H-I-C-K-E-Y♪♪ (M-O-U-S-E). Thanks Ann!

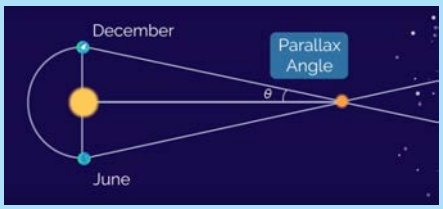
The video tonight was Lecture 5 Galaxies and Clusters of the Great Courses series titled "Dark Matter, Dark Energy: The Dark Side of the Universe," by Professor Sean Carroll of Cal. Tech. There were several Major points to consider from the lecture: 1) The Cosmic Microwave Background (CMB), a record of the temperature of the Universe when it was only 300,000 years old, is slightly uneven across space (1 in 100,000) and is responsible for the clumsiness of the universe we observe today. Over time, gravity acted like a "contrast knob", forcing large bodies to form out of smaller clumps in a bottom-up manner. Stars, planets and galaxies. When we look into deep space with telescopes, we see galaxies at vastly different distances and times in the past at different stages of evolution. 2) When we look at galaxies we see stars and can estimate the total mass of the stars. But is there unseen stuff? How to weigh a galaxy? In the 1970's, Vera Rubin pioneered the measurement of rotation curves: measure the speed of gas and dust as it rotates around the galaxy. According to the law of gravity, particles should move faster near a galactic center and slower further out. But she found that the rotation speed remains approximately constant near and far, indicating unseen matter that accounts for the extra gravity. There appears to be a halo of matter around the visible part of the galaxies. 3) Galaxy clusters are common throughout the universe - X-ray telescopes show a lot of gas in between the galaxies. Most of the matter in the cluster is not in the galaxies themselves but in between. When the X-rays emitted by the heated intergalactic gas is measured and by measuring the average continued on page 4

Astronomy Quiz

1. Brocchi's Cluster is a random grouping of stars located in the constellation Vulpecula near the border with Sagitta. What famous asterism is found in Brocchi's Cluster?

2. Nobel laureat Subrahmanyan Chandrasekhar in 1931 proposed a limit on the maximum mass of a white dwarf beyond which gravity would overcome the electron degeneracy pressure and the white dwarf would collapse into a neutron star or black hole. In what country was this man born?

3. The below image shows the definition of a parallax angle, the



sun on the left and a star on the right. The parallax angle is marked with Θ. A parsec is defined as the distance at which the parallax angle is _____.

4. For each characteristic, indicate RC for Ritchey-Cretien, SCT for Schmidt-Cassegrain, or Both:

a) spherical primary mirror
b) diffraction spikes
c) corrector plate
d) Cassegrain type
e) catadiopteric
f) fixed primary mirror
g) coma
h) astigmatism.

Meeting notes from page 3

velocity of galaxies in clusters, there still is not enough observed matter to account for galaxy movements. It appears the clusters have 5 times the mass observed. This was actually pointed out by Caltech astronomer Fritz Zwicky in the 1930's - ordinary matter is not enough to explain the discrepancy. We need dark matter. 4) Dr. Carroll concluded by saying that, even though dark matter could be ordinary that is hard to see, there are reasons that indicate in must be a completely new kind of particle. 5) Does the universe have a critical density to make its geometry flat, or Euclidean? They say that further "stuff" is needed to keep the universe flat - dark energy.

Tom Minahan

This Month in Astronomy
July 1994
"The Astronomy Event of the Century"

We all know what happened 50 years ago this July: the first manned moon landing by Apollo 11 on July 20, 1969. But what event in July of 1994 was dubbed "The astronomical event of the century" by several publications that year? It was the fascinating impact of fragments of Comet Shoemaker-Levy 9 with the giant gas planet Jupiter.

David H. Levy, Eugene "Gene" Shoemaker, and Carolyn Shoemaker were comet hunters who collaborated on the discovery of several comets. On March 24 of 1993, using the 18" Schmidt telescope at Palomar Observatory in California, they discovered a comet which was given the official name of Comet Shoemaker-Levy 9 (because the discovery of other comets had been attributed to them). Continued observation revealed that the comet was fragmented and that the orbit of the fragments indicated that they would strike Jupiter the following July.

"At about 5 p.m. PST on March 25, 1993, David Levy, Eugene Shoemaker, and Carolyn Shoemaker asked Jim Scotti at Kitt Peak Observatory near Tucson, Ariz., to confirm their codiscovery of a new comet with the Spacewatch 36-inch telescope. 'Do we have a comet?' David Levy asked. The response: 'Boy, do you ever have a comet!' Jim Scotti reported seeing at least five separate comet pieces side by side with additional comet matter between them. (The Daily Comet).

Never before had astronomers directly observed a collision of bodies in the solar system outside of earth. The Hubble Space Telescope (HST) was recruited to document the events. But the HST entered safe mode unexpectedly and it was determined that a memory board had failed. Then it went into a deeper sleep mode suggesting problems with 2 gyros that position and maintain orientation of the telescope. But all 6 gyros had recently been replaced and hardware monitoring indicated that they were all working properly. Fortunately it was discovered that resetting a counter in software could solve the problem. That was done by July 9 in time for HST to join other telescopes around the world in watching for this event.

On May 19, 1993, Syuichi Nakano computed an orbit which indicated that the comet had passed close to Jupiter in 1992 and the orbit would cross closer to the center of Jupiter than its radius—in other words it would impact Jupiter. This orbit was especially fascinating in that most comets orbit the sun, not one of the planets.

As "dirty ice balls" or "icy dirt balls", comets tend to be quite fragile. Based on the computed orbit,
continued on page 6

Poetry Corner

Song of the Moon
by Claude McKay

The moonlight breaks upon the city's domes,
And falls along cemented steel and stone,
Upon the grayness of a million homes,
Lugubrious in unchanging monotone.
Upon the clothes behind the tenement,
That hang like ghosts suspended from the lines,
Linking each flat to each indifferent,
Incongruous and strange the moonlight shines.

There is no magic from your presence here,
Ho, moon, sad moon, tuck up your trailing robe,
Whose silver seems antique and so severe
Against the glow of one electric globe.

Go spill your beauty on the laughing faces
Of happy flowers that bloom a thousand hues,
Waiting on tiptoe in the wilding spaces,
To drink your wine mixed with sweet drafts of dews.

NSN article from page 2
You can catch up on all of NASA's current and future missions at nasa.gov.

The previous article was provided as a service by NASA Night Sky Network.

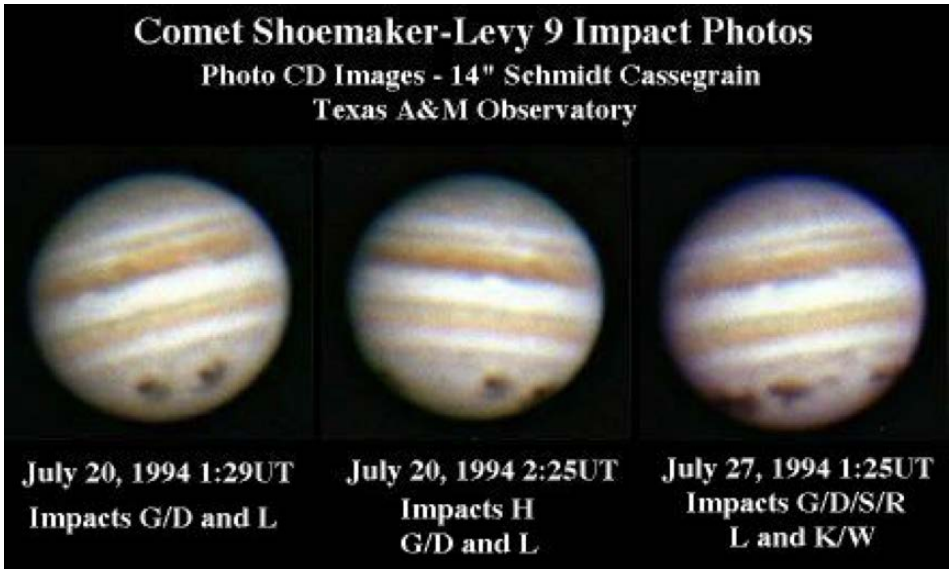
Outreach

DPAS really reached out in June of 2019. A large part was a result of the Society having obtained a state of the art inflatable, portable planetarium. Dave Lenius and Tom Gwilym led several shows with a few members assisting in getting viewers into and out of the dome. As of June 24, 416 children and adults have experienced the planetarium programs!

Public information discussions regarding the the library telescope loaning program were held at Sturgeon Bay, Egg Harbor, Sister Bay, and Bailey's Harbor library branches.

The public is being invited to the **Three Night Weekend Under the Stars**
August 23-25
at Newport State Park arranged by our Outreach Chairman, Tom Minahan. A staffed, designated viewing area and some members' telescopes will be available for taking advantage of the special dark skies from this Dark Sky Park as designated in 2017 by the International Dark-Skies Association.

Remember that the only camping at Newport State Park is primitive camping involving hiking into your campsite. But the park does allow people to come and go for organized activities.



See: This Month in Astronomy,
"Astronomy Event of the Century",
July 1994
on page 4

Astronomy Quiz Answers

1. The Coathanger.

2. Subrahmanyan Chandrasekhar was born in Pakistan. He was an astrophysisit who later lived in the USA.

3. A parsec is defined as the distance at which the parallax angle is one arcsecond.

4. a) SCT. RC has hyperbolic mirors.
b) RC. The secondary mirror is supported by vanes referred to as a spider; SCT's secondary is mounted on the corrector plate.
c) RC. Like the Maksutov-Cassegrain, a corrector plate corrects for the spherical primary.
d) Both. They use a folded optical design.
e) SCT. Catadioptric telescopes use both reflective and refractive elements; the RC is totally reflective.
f) RC. The primary moves in focusing the SCT.
g) SCT. Stars are elongated and asymmetrical.
h) RC. The RC trades coma for astigmatism. Stars are elongatee but symmetrical.

Viewing Nights

The following is the tentative list of viewing nights for 2019. Changes will be posted here and at

www.doorastronomy.org

July 6
August 3
August 28
September 28
October 26
November 23
December 28

Note: If skies are cloudy, a program will be presented at the Astronomy Center.

Some summer viewing may be cancelled because it gets dark so late.

event of the year from page 4

Shoemaker-Levy 9 passed within 15,500 miles of Jupiter. That would be within the Roche limit, within which the difference between Jupiter's gravity on the far side *vs* on the near size would cause an object to break apart. That's a rather extreme example of tidal forces. Initially it would be like a disorganized cluster of fragments which would, over a period of about 2 hours, line up in a row pointing to and away from Jupiter. As the fragments separated, they could be imaged as a string of bright objects.

Astronomers, professionals and amateurs alike, pointed their telescopes at Jupiter over July 16 to 24, 1994. The first impacts were on the side of Jupiter not facing earth, but soon the rotation of the planet brought into view the scars caused by the impacts. Later, one of the some 21 fragments labelled fragment G encountered Jupiter's thin atmosphere and the shock wave produced an extremely brilliant flash. The impact "scar" was larger than our entire planet.

Since the SL9 impact, there has been evidence of others, and today there may well be disagreement as to what was the "astronomical event of the century". But the event was predicted, captured on many images, and served as inspiration for movies. Residuals of the impacts were detectable for over 2 years. Information about the Jovian atmosphere and winds was obtained by studying the impact sites. And Gene Shoemaker's lifelong dream was fulfilled.

Editor

This article has been submitted to the Peninsula Pulse and is used here by permission of the Pensula Pulse and doorcountypulse.com.

Images on page 5

Elections

The Board has nominated the following slate of officers, to be voted on at the July 2 general meeting. Nominations from the floor can be made at that time.

President – Dave Lenius

Vice-President – Tom Gwilym

Secretaries:
Correspondence – Susan Basten
Board – Jacque Axland

Member Meetings – Tom Minahan

Treasurer – Susan Basten

Outreach – Tom Minahan

Membership Chairman – Jacque Axland

Program Chairman – Steve Ransom-Jones

Above is an image of students, parents, and leaders coming and going at a demonstration of the Digitalis portable, inflatable planetarium at the Sturgeon Bay Library. Photo by Tom Gwilym.