



THE BLUE MOON OBSERVER

Door Peninsula Astronomical Society

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www.doorastronomy.org

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March, 2018 Volume 20 Number 3



The March general meeting of DPAS will take place on Tuesday, March 6, at 7 PM at the Ray & Rutie Stonecipher Astronomy Center. "Time and Relative Dimensions in Space - The Future" will be the main program delivered by Steve Ransom-Jones. The monthly "Learning the Night Sky" topic will be "Using a Planisphere - Taurus" presented by Dave Lenius.

Notes from the General Meeting February 6, 2018

The attendance was 22, including board members. Also attending was Ms. [??] Henke, a founding member of the Door Peninsula Astronomical Society in 199?.

After introductions all around and a welcome to our new members John McGitty and Liz Walter, President Gary Henhelmann promoted the upcoming NCRAL 2018 convention on May 4-5, hosted by DPAS at The Lodge at Leathem Smith. The weekend meeting of amateur and professional astronomers from around the midwest will include lectures and presentations, night sky viewing if clear, banquet dining, social hours and door prizes! Accommodations are available. Sign-up for NCRAL 2018 at www.doorastronomy.org/ncral-2018.

Two themes for our general meetings in 2018 were introduced: 1) Learning the night sky. Basics of finding your way around the constellations and stars visible in the northern hemisphere throughout the year. 2) A series of video lectures titled Mysteries of the Expanding Universe, a Great Courses Lecture Series. Presented by Sean Carroll PhD, researcher and lecturer at CalTech.

After some informal discussion on the day's successful Space-X launch, in which Elon Musk's old Tesla automobile was added to the swarm of space junk, Gary Henkelmann gave a synopsis of the major astronomy discoveries of the 20th Century:

- The universe is very much larger than anyone believed.
- Something other than visible matter holds a galaxy together.
- The universe is expanding.
- The expansion is accelerating.

The mystery "substance" that affects galaxy rotation has been dubbed Dark Matter, even though no one knows what it might be for sure, The entity which accelerates the expansion of the universe is named Dark Energy.

The first lecture "Fundamental Building Blocks" was an overview to the lecture series and covered introductions to the following topics: the Standard Model of particle physics and the General Theory of Relativity constitute all physicists know with any certainty about the structure of the universe; greek philosopher Democritus and the concept of the atom [indivisible in ancient greek], the discovery in the 19th Century of many elements
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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.

Related Organizations

Night Sky Network is part of the Astronomical Society of the Pacific, the Jet Propulsion Laboratory, and NASA. They supply kits for teaching basic astronomy principles to a broad range of ages. DPAS has used their materials in the past and presumably will be revisiting our ongoing relationship with this service.

<https://nightsky.jpl.nasa.gov/>

The Planetary Society is not formally associated with DPAS although some members of DPAS belong to the Planetary Society. It is "the world's largest non-profit space interest organization" and is headed by Bill Nye, "The Science Guy".

The Planetary Society's four core enterprises are:

- * Robotic space exploration
- * Human space exploration
- * Planetary defense
- * The search for life

For information, check out: <http://www.planetary.org/>

The **International Dark-Sky Association** has close ties with DPAS in part because DPAS has sponsored programs on preserving our dark skies including bringing the Dark Ranger, Kevin Poe, to speak at our programs and to school children. He will be the keynote speaker at NCRAL 2018 which DPAS is sponsoring this May. IDA will supply

banners and brochures for the event. IDA will also feature prominently in NCRAL 2018 as part of the program has to do with the designation of Newport State Park as an IDA Dark Sky Park. DPAS members participated in the process, including the push by the late Dr. Ray Stonecipher for this to happen.

AAVSO, the American Association of Variable Star Observers, is not directly associated with DPAS but our organization has used their materials from time to time in discussing the significance of the study of variable stars including the vital role which amateurs continue to play in this fascinating field of astronomy. Their website is due to be renovated by March 6, the date of our general meeting. <https://www.aavso.org/>

The Astronomical League is of course our parent organization. One of the activities of the Astronomical League is its observing programs. These are great for folks who want to learn the night sky and even earn rewards for completing any of many programs. Two popular ones are the Messier Program and the Binocular Messier Program. Check these out on the AL website along with a guide to seeing Mars and Saturn in relation to 3 star clusters this month. <https://www.astroleague.org/>

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 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.



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meeting notes from page 1 and how they interact; the discovery of elementary particles and the quest for more massive ones; hypotheses trying to explain the gravitational effects of unseen (dark) matter; concepts of space and time according to General Relativity; nucleosynthesis during the Big Bang; and the Cosmic Background Radiation (CMB).

Someone asked how astronomers know that the expansion of the universe is accelerating. The precise answer is rather complicated, but the simplified answer is: astronomers can accurately measure the distances to galaxies near and far and they can measure how fast they are moving - away from each other essentially. Make a 3-D map of these galaxies' positions and speeds and the acceleration becomes evident.

Refreshments were provided by the Egans and included 3 gourmet cheeses and a smoked salmon dip. Enjoyed by all.

Dr. Beck then gave an introduction to the major constellations visible in the winter: Orion, Gemini, Auriga and the circumpolar asterisms The Big Dipper and Cassiopeia. The latter are easy to find and are a good starting place from which to "star hop" to other regions of the night sky.

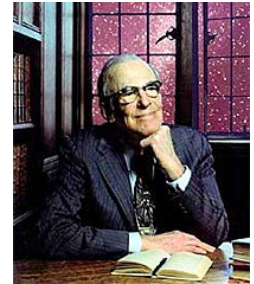
Cloudy skies prevented us from constellation viewing.

Tom Minahan

The Legacy of Lyman Spitzer



No, Lyman Spitzer did not take the image of the Hubble Ultra Deep Field. In fact, he was not alive when the image was taken. And it was not taken by the space telescope which bears his name. So why is the Hubble Ultra Deep Field part of this man's legacy?



Lyman Spitzer was born in 1914 in Toledo, Ohio. He obtained his bachelor's degree in physics at Yale University and after a year at Cambridge earned his masters and doctorate degrees in astrophysics at Princeton, the latter in 1938, while working under the noted astronomer Henry Norris Russell. He spent a post doctoral fellowship at Harvard before joining the faculty at Yale in 1939.

During World War II he was involved with a team doing underwater sound research leading to the development of sonar. After the war, Spitzer taught at Yale briefly before being appointed chairman of Princeton's astrophysical sciences department in 1947, succeeding Henry Norris Russell. He also became director of Princeton's observatory which, along with Martin Schwarzschild, he built into a major research facility.

Some of his accomplishments include that he is considered to be the founder of the study of the interstellar medium. He studied the motion of star clusters and their evolution. He proposed that bright stars in spiral galaxies were recently born of gas and dust in those galaxies. He accurately predicted the hot halo surrounding our MilkyWay Galaxy.

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Astronomy Quiz

1. Of the following, which is not a moon of Saturn?

- Tethys
- Iapetus
- Kerberos
- Polydeuces

2. A refractor with objective of 100 mm and focal length of 600 mm is fitted with an eyepiece with focal length of 6 mm. What is the exit pupil?

3. The Large Magellanic Cloud (LGM) was considered to be the closest companion galaxy to the Milky Way Galaxy until two closer galaxies were discovered. The closest is the Canis Major Dwarf. What galaxy is closer than the LGM but farther than the Canis Major Dwarf?

4. The image below is an emission spectrum and a corresponding absorption spectrum, one above the other.

Which is the emission and which the absorption spectrum?

These are spectra of which element?

Spitzer continued from page 3

In 1951, Spitzer founded the Princeton Plasma Physics Laboratory, a pioneering program in controlled thermonuclear research. He pioneered efforts to harness nuclear fusion as a clean source of energy. He continued as director until 1967. Also, a year after founding the laboratory he was named the Charles A. Young Professor of Astronomy at Princeton and held that title for the remainder of his life.

Back to his legacy. In 1946, over 10 years before the first satellite was launched into space and 12 years before NASA was formed, Lyman Spitzer proposed placing an observatory in space. It could obtain data at various wavelengths, avoiding the atmospheric limitations of earth-based telescopes. He was the first to forward such a proposal and was a driving force behind the development of the Hubble Space Telescope.

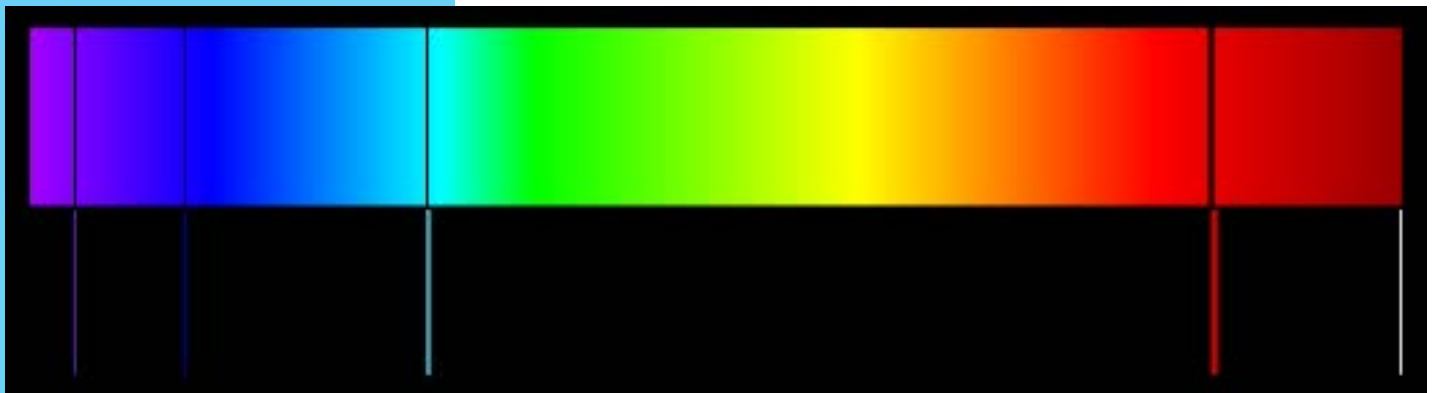
Lyman Spitzer served as President of the American Astronomical Society from 1960 to 1962. In 1962 he led the development of an orbiting telescope which would study ultraviolet radiation from space. UV light is largely blocked by Earth's atmosphere. It operated as the Copernicus satellite from 1972 to 1981.



A committee to define the objectives for a proposed Large Space Telescope was formed by the National Academy of Sciences in 1965. Lyman Spitzer was chosen to chair this committee. He fought opposition from astronomers who feared that the costs of such a project would divert funds which could support Earth-based observatories but he persisted and in 1968 his dream was fulfilled by the launch of the highly successful Orbiting Astronomical Observatory.

He continued to push for a space telescope and in 1975, NASA along with the European Space Agency began development of what would become the Hubble Space Telescope. The following year, NASA awarded him with its Distinguished Public Service Medal for "his pioneering efforts in rocket and high altitude balloon astronomy, his outstanding contributions to space astronomy as principal investigator on the highly successful Orbiting Astronomical Observatory, Copernicus, and his vision and leadership in articulating the advantages and benefits to be realized from the Space Telescope Program".

The Hubble Space Telescope was delivered into space by the Space Shuttle in 1990, 44 years after Spitzer first proposed placing a large telescope into place. You can read more of Lyman Spitzer Jr.'s awards and accomplishments at <http://www.spitzer.caltech.edu/mission/241-Lyman-Spitzer-Jr>



Poetry Corner

PEACE ON EARTH

The Archer is wake!
The Swan is flying!
Gold against blue
An Arrow is lying.
There is hunting in heaven--
Sleep safe till to-morrow.
The Bears are abroad!
The Eagle is screaming!
Gold against blue
Their eyes are gleaming!
Sleep!
Sleep safe till to-morrow.
The Sisters lie
With their arms intertwining;
Gold against blue
Their hair is shining!
The Serpent writhes!
Orion is listening!
Gold against blue
His sword is glistening!
Sleep!
There is hunting in heaven--
Sleep safe till to-morrow.

William Carlos Williams

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.

March: Time and Relative Dimensions in Space - The Future of Time Travel

April: Video: The Smooth, Expanding Universe

May: Measuring Gravity (Newton to LIGO)

June: Video: Space, Time and Gravity

July: Atmospheric Physics of the Terrestrial Planets

August: Video: Cosmology in Einstein's Universe

September: Black Holes

October: Video: Galaxies and Clusters

November: Intentionally left open

December: Video: Gravitational Lensing

The monthly series of programs, in addition to the feature programs, will be "Learning the Sky and Constellations."

Viewing Activity

Lesson learned. Our last viewing night was February 16. The sky was cloudy all day and the forecast was for clouds. Your editor (and others) stayed home. Fortunately the indomitable Dave Lenius did open the Leif Everson Observatory and a number of people arrived. Dave was able to log onto other observatory sites and show what was viewable from those locations. Then the sky cleared and Dave demonstrated the equipment and was able to guide the 14" Celestron to various objects in the sky for all to view.

In the future I will attempt to be present for all viewing nights regardless of sky conditions and I hope that others will as well.

Another lesson learned: Dave Lenius and Steve Ransom-Jones have spent many hours updating the hardware and software, repairing and maintaining the equipment at the Leif Everson Observatory. It is now in condition that others can and should learn to operate the observatory in the absence of one of these men.

A big shout out to Dave for "saving" our February viewing night and to Dave and Steve for bringing the Lief Everson Observatory back up to its potential and beyond as a result of new equipment and their dedication and expertise.

Astronomy Quiz Answers

1. Kerberos is a moon of Pluto, not of Saturn.
2. The exit pupil is one mm. The focal ratio of the telescope is F6 (600mm focal length/100 mm clear aperture. Exit pupil = eye-piece focal length/telescope F ratio, $6/6 = 1$. Or, magnification = $100\times$ (focal length of telescope/focal length of eye-piece). Exit pupil = telescope aperture/magnification or $100/100$.
3. SagDEG, the Sagittarius Dwarf Elliptical Galaxy.
4. The absorption spectrum of Nitrogen is above the emission spectrum.

Viewing Nights 2018

March 17

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.

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.