



Penobscot Valley Star Gazers

An Astronomical Society of Central Maine

<http://www.gazers.org>

The wild and windy March once more
Has shut his gates of sleet,
And given us back the April time,
So fickle and so sweet.
- Alice Cary



April 2021

A Visit to the CFHT

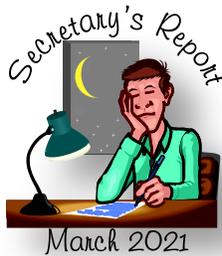
The April 2021 meeting of the PVSG will be held on **Tuesday the 13th at 7:00 pm** via Zoom. Here's what Dwight says about it:

"I have been having continuing discussions with Versant Astronomy Director, Shawn Laatsch, about Keck and telescope operations in Hawaii. So I am pleased to announce that Shawn has been able to secure a special speaker for next month's PVSG meeting. Dr. Doug Simons, director of the Canada France Hawaii Telescope, and previous director of Gemini Observatory will join a combined meeting of the Penobscot Valley Star Gazers, UMO Astronomy Students, Maine School of Science & Mathematics in Limestone, and Downeast Amateur Astronomers. See the attachment for more information about the presentation and speaker.

There will be no PVSG meeting on April 12, instead, to coordinate with the combined groups, next month's PVSG meeting will be held on Tuesday April 13th at 7:00 pm.

Please email Shawn at planetarium@maine.edu to reserve your place for the program. He'll send out the Zoom link as the date approaches. Thank you Shawn."

Thanks for last month's program go to Dave for his presentation on binoculars and to all those who participated in the binoculars show-and-tell.



Seeing Double

PVSG Monthly Meeting Minutes
March 8, 2021
Zoom

Note: Some of the information provided in these minutes are recorded out of order to allow for organizing them according to their normal meeting section.

Meeting:

Call to Order and Welcome to Visitors

The meeting was held by Zoom video-conference and called to order by Dwight Lanpher at approximately 6:36 PM.

Attendance:

Members:

Dwight Lanpher – President
Scott Burgess – Vice President
David Clark - Treasurer
Phil Normand – Secretary
Audrey Brown
Alan Davenport
Jill McDonald
Bill Shackelford
Shawn Laatsch
Ralph Mallett
Don Krause
Peter Coughlin
Wade & Donna Smith
Mary-Frances Beesorchar
Andy Brown

Programs and Astro Shorts

Program: Dave gave a presentation on binoculars and the types of prisms used to make them.

Before Dave started talking about the prisms used in binoculars, he shared two images of Comet Neowise showing lots of amazing detail. The second image had labels for all the features including the White Dust Tail, The Blue Ion Tail, The Red Sodium Tail, The Nucleus, The Green Coma, as well as the direction of the Solar Wind and Motion of the Comet in general.

Dave first discussed Porro prisms. Binoculars using Porro prisms can be identified by their shape where the binocular's objectives are wider than the placement of the eyepieces. The light entering the objective of this type of binocular changes directions 5 times before exiting the eyepiece and produces a right-side up image. Porro prisms are of two types: BAK-4, made of Barium Crown glass and BK7, made of Borosilicate Crown glass. Dave then discussed the three main types of roof prisms used in binoculars: Amici, Schmidt-Pechan and Abbe-



Koenig. These prisms have several differing shapes and include coatings on certain surfaces to allow for right-side up images and are much lighter than binoculars made with Porro prisms. Roof prisms also allow for better water-proofing. Larger Roof prism binoculars can get very expensive.

Discussion of binoculars used by members:

Dave showed the group several pairs of binoculars that he uses. They were of differing size, power and prism type. **Bill** showed off his smaller binos that he holds by hand when observing and then showed his Zhumell 25 X 100 binos that he has mounted on a parallelogram mount. **Wade** showed off several pairs of older binos that he gets excellent viewing with, including a large pair he mounts on a tripod. **Jill** showed a pair of smaller binos made by Bushnell that can capture images but she said she was having problems getting the images from the binos' file storage. **Pete** stated that he almost exclusively views the night sky with binoculars. He has a tripod mounted large pair of Oberwerk binos. He advises people to not jump directly into telescopes for astronomical viewing, but rather observe with the naked eye and binoculars first. **Mary-Frances** said she had a pair of binos that she had not yet used to observe the night sky, but that she might do that after the conclusion of the meeting. **Phil** stated that he uses a pair of Celestron Skywatcher 8 X 56 binos and a new Orion Paragon Plus mount. He said he is looking to get a larger pair and is seeing what he can buy that doesn't exceed the 5.5 pound weight limit of the mount. **Dwight** showed the group an Orion linear binoviewer that he purchased. **Dwight** said I liked his Williams Optics but had trouble with them maintaining collimation. He purchased a cheap pair of Arcturus binoviewers and got rid of them because they were not good. **Dwight** also reported that the considerably more expensive TeleVue Bionoviewers were not considered highly recommended. He later reported that the similarly high priced Denkmeier's Binotrons were generally favorably regarded.

Secretary's Report and Acceptance of Minutes

Dwight let group know that he was happy that PVSG was one of only two astronomy groups that publish a monthly newsletter. Minutes were unanimously accepted.

Treasurer's Report

Dave reported that this month's total is \$475.67. More dues expected to come in this coming week. The Treasurer's report was unanimously accepted.

Observing Reports:

Wade said that he observed a huge halo around the full moon. **Dave** said he was still enjoying watching the changes in altitude of the full moon versus the last quarter moon. **Dwight** said he has been following Orion as it's made it's way across the sky. **Scott** said that he had partnered with Shawn to allow John Bapst students to observe using Slooh. He also said that he was waiting on some clear ground so he could setup his 17" reflector and use his video equipment to stream observations for his students. He also said he has been watching Orion head West. **Pete** said he has observed a sunset in Portland while he was driving that presented a double pillar, one above and one below a band of clouds. A brief discussion of halos ensued and members mentioned several books that they had which covered the topic including one mentioned by **Dave** titled Atmospheric Halos by Walter Tape. **Bill** mentioned he once saw a halo while looking down into the Grand Canyon. **Scott** mentioned that an article in the March edition of Sky & Telescope by Tom Caldwell on Betelgeuse's dimming included data that he had provided through his observations of the star. **Pete** mentioned the moon mosaic created by a couple of younger astronomers in the mid-west who stacked images of the moon as the terminator line moved across it over time.

Old Business

None

New Business

Before we adjourned Dwight answered one last inquiry about the Acadia Night Sky Festival. Dwight confirmed that there will be no Seawall or Cadillac star parties or any events with the public viewing at telescopes. The festival committee is still working on programming and there may be a few lectures, possibly live with simultaneous Zoom coverage.

Adjournment

The meeting adjourned shortly after 8:30 PM.

Phil



Observe The Sky This Month

Some Selected Objects

April 2021

General sky comments – I am curious how everyone feels about Daylight Saving Time. These are my thoughts about time zones and how they are set. I live in the Central Time Zone. However my time zone is physically west of the natural time zone break. If time zones were set by meridians as original proposed I would be in the Mountain Time Zone. The original proposed dividing line between Central and Mountain Time zones was set at the 100th meridian. My longitude is 101.48°W. The entire state of Oklahoma is on Central Time with the exception of the town of Kenton in the far western end of the panhandle. The Kenton post office serves a large rural area mostly on Mountain Time thus the time zone. In the summer here often the sun does not set until almost 10 pm during Daylight Saving Time. It makes sense to me to either eliminate Daylight Saving Time or move my part of Oklahoma into Mountain Time. Kansas north of me is divided into Central and Mountain Times. When I was living in Maine it made sense to me to move Maine into Atlantic Time. Incidentally, Benjamin Franklin did not propose Daylight Saving Time. He proposed a cannon should be fired at sunrise to be sure everyone was awake. Here we have a system of sirens to warn the populace of a tornado. My small city used to turn the sirens on at noon every day for testing. In the years since I have returned to Oklahoma the sirens have only been used once for a tornado warning and there was no resulting tornado. Maybe we can discuss our thoughts on Daylight Saving Time or time zones in general at or before the next meeting. The Lyrid meteor shower peaks on the 22nd only a few hours before prime observing time on the morning of Monday the 23rd. Unfortunately this year the Lyrids fall within a few days of full moon making it a very poor night to observe. The good thing is the Lyrids tend to be slow moving leaving bright trails.

Planets this month – Before the PVSG meeting this month on Tuesday the 13th of April the last quarter Moon was on Sunday the 4th and the new Moon was on Sunday the 11th. First quarter will be on Tuesday the 20th and full Moon will be on Monday the 26th. Mercury is in the morning and evening sky this month. By the time of our April meeting Mercury will be too close to conjunction with the Sun to observe and by the time it appears in the evening sky it will be very low. Venus is too close to the Sun in the morning sky to observe and barely observable in the evening sky late in the month. Mars is in the evening sky in Taurus and passes into Gemini late in the month. By mid-month it forms the apex of a triangle with two other red objects the orange stars Aldebaran and Betelgeuse. The Moon makes a close pass to Mars on the 17th. Mars passes

0.5° N of M35 on the 26th – 27th. Jupiter is in the SE morning twilight sky moving in retrograde while also moving away from the Sun consequently it makes very little progress west. Saturn is in the morning sky in Capricornus. The waning crescent Moon passed very close to both Saturn and Jupiter on the 6th and 7th. Uranus is very low in the early evening sky and is in conjunction with the Sun on the 30th. Neptune (Οὐρανός) is visible with a telescope in morning twilight in Aquarius. Pluto is in the morning sky in eastern Sagittarius.

Constellations for the month – Antlia, the Air Pump, originally Antlia Pneumatica, it was changed to the single word by William Herschel. Antlia (Latin for pump from the Greek *άντλος*, *bucket on a rope used to bail a ship*) has been said to be the least interesting of all the constellations by several astronomy guide authors. This air pump is not a tire or water pump but a vacuum pump. Lacaille considered it one of the important inventions of his day along with: Pyxis, the Compass, Fornax, the Chemical Furnace, Telescopium, the telescope, Microscopium, the microscope and Reticulum, the Reticle. He added all of these devices to the sky. Antlia does contain a nice optical double star zeta₁ (ζ) Antlia along with zeta₂ (ζ) Antlia, also double and easily separated with small telescopes. Antlia also contains a lot of galaxies but they are too far south and dim for most of us to observe. Higher in the sky after the dim stars of Antlia we soon find an easily seen star Alphard, alpha (α) Hydra mag. 1.98 the next eastern part of Hydra, the Water Snake after the head we located last month. Alphard “The Solitary One” is aptly named due to the absence of bright stars in the area and its red orange color a fitting color for the heart of the snake. This portion of Hydra contains an easily seen planetary nebula NGC 3242, “The Ghost of Jupiter” because it has a blue disk almost the same size as Jupiter. The central star can be seen in some scopes. See if you can pick it out. This planetary is locate 1.5° SSW of mu (μ) Hydra mag. 3.82, the third bright star east of Alphard in the constellation. Continuing on down Hydra visually and after a couple of stars you should see a rather distinctive constellation attached to the back of Hydra. It actually looks like its namesake: Crater, the cup, a circle of dim stars and two brighter stars connecting it to the back of Hydra. When I first saw Crater I was surprised how easy it was to identify, especially at a dark site. Immediately to the east of Crater is a grouping of 3rd mag. stars in a rough trapezoid representing Corvus, the Crow. Corvus is very easy to find and is distinctive even at my urban site when I am out of sight of my horrible lighting. Corvus, Crater, and Hydra are connected together in mythology. The Roman version says Apollo sent Corvus with his cup to bring pure water back to him for a sacrifice to Jupiter. Corvus found a fig tree on the way to get the water and as the figs were not yet ripe Corvus waited for them to ripen to get figs to eat. When the crow finally returned to Apollo with the cup full of water he also had a water serpent in his claws. Corvus used the serpent as a reason for the delay but Apollo saw through the decep-

tion and put both Corvus and the water snake Hydra in the sky with the cup on the serpent's back. Apollo also put Corvus just out of reach of the cup full of water. This is why crows have such a raspy voice because they are always thirsty. I have observed the planetary nebula NGC 4361 $2\frac{1}{2}^\circ$ SE of Glenah gamma (γ) Corvus but no other deep sky objects in either Corvus or Crater. On my list to observe is NGC 4038/4039 $3\frac{1}{2}^\circ$ SW of gamma. This is the peculiar Ringtail or Antenna galaxy famous because of a beautiful Hubble telescope photograph. Above the middle of Hydra and to the northwest of Crater is another small and mostly obscure constellation Sextans, the Sextant. It was created by the Polish astronomer Hevelius to commemorate the large Sextant he used at his observatory. He was probably the last major astronomer to use the sextant to visually plot the positions of the stars. It does contain a fair number of galaxies but the only one we will consider is NGC 3115, the Spindle galaxy a lens shaped galaxy visible in binoculars but best seen with larger telescopes. To find it go 7° south of alpha (α) Sextans or 3° east of delta (δ) Sextans. It should be visible in any optical finder. Above the constellations Crater and Sextant is one of the most recognizable constellations in the sky, Leo, the Lion. It is noted for the distinctive asterism of the sickle a backward question mark forming the head of the lion. Leo, the Lion is a Zodiac constellation with its origin in ancient Babylonia where the lion was sacred to the goddess of love and war Ishtar. The Greek equivalent was Aphrodite becoming Venus for the Romans. Babylonians used both lions and bulls and the conflict between the two in many stories. Leo is found away from the Milky Way and consequently contains numerous galaxies. Fortunately for us many are particularly bright and Messier used a lot of them in his famous list. The brightest star in Leo is the heart of the lion Regulus, the alpha (α) star. The next brightest star in the sickle Algieba, gamma (γ) is a two shades of yellow double star visible with small scopes. A triple star system a bit harder to find is 90 Leo. Look 4° NW of Denebola, beta (β) Leo, the tail star of Leo to find this close pair of blue-white stars and a blue star $63''$ away to the SW. We will next consider the Messier galaxies of Leo and also find some of the galaxies Messier could have used as well. Start at Regulus alpha (α) Leo and go 9° east to find a group of bright galaxies, two side by side and two closer together 1° ENE above the left galaxy. This is the M96 group of Leo galaxies. M95 (NGC 3351) is on the right and M96 (NGC 3368) is on the left. Above M96 1° NE is M105 (NGC 3379). You should also observe the first of the near Messier galaxies NGC 3384 next to M105. It would not surprise me if Messier thought these two galaxies were one nebula or a star and a nebula. From this group go 8° east and the M66 (NGC 3627) M65 (NGC 3623) group should appear. Above these two galaxies is NGC 3628 another near Messier galaxy. All three galaxies are spiral galaxies inclined at different angles to the viewer and less than 1° , apart aka the Leo Triplet. The other near Messier galaxy (NGC 2903) is located quite distant from the Messier galaxies but still very much in Leo. To find NGC 2903

go to the end bright star in the sickle, epsilon (ϵ) Leo. Then proceed 3° WSW to the 4.31 mag lambda (λ) Leo. $1\frac{1}{2}^\circ$ south is NGC 2903. NGC 2903 is one of the nicest galaxies for small telescopes and is easily visible in binoculars. Above Leo is another inconspicuous small diamond shaped constellation Leo Minor, the Little Lion. (See below) Above Leo and Leo Minor is an interesting asterism we will need to look up into the sky with no aid but our eyes to find. Look above the hind quarters of Leo and you should see a pair of third magnitude stars. Using your fist as a measuring tool go a little over one fist width to the NW to another pair of stars and then about the same distance to another pair. Arab cultures know this asterism of three pairs of stars (Alula), (Tania), and (Talitha) as "the three leaps of the gazelles". One version of the story is a lion (Leo) is sitting beside a pool (Coma) the lion switches his tail disturbing the water in the pool thus frightening some gazelles who leap off away from the pool leaving these star tracks in the sky. We recognize these gazelle tracks in the sky as the feet of our next constellation north, Ursa Major, the Great Bear. Because Ursa Major is the third largest constellation we will break it into parts and consider only the far northern portion this month. This portion contains many galaxies including the M81, M82 group many of us have observed. To find M81, M82, and NGC 3077 start at the bright star Dubhe, alpha (α) Ursa Major, the star at the upper right corner of the dipper asterism. From Dubhe go 10° NW to this group visible in most finder views. Or start at 23 Ursa Major the bright star 10° to the east of Dubhe and go 6° NNE to the group. There are several other galaxies on my observing list in this area including NGC 2976, NGC 2787, NGC 2985, NGC 3147, and NGC 2655 although the first is in Draco and the second is in Camelopardalis. For more information on Ursa Major look at end of this article in other objects of interest.

Featured star – The second brightest star in Leo is gamma (γ) aka Algieba from the Arabic Al Jabhah meaning the forehead although it is in the mane of the lion. Algieba is the bright star above Regulus at the back of the head of Leo. It is a double star easily separated (4 arc/sec.) with almost any telescope. There is some evidence of another three companion stars in the system but this has not been definitely proven. One or more planets were announced to be in this system in 2009 but now one of the planets was determined to be an observation of the pulsation of the primary star and the second planet is also now under review. Both stars are giant stars no longer fusing hydrogen to helium and expanded to their current sizes. It is not clear if either of the two stars are fusing helium at the present time or if they are in a preliminary stage of helium fusion. Information through their spectra suggest they may be fusing helium. The combined magnitude of the two stars is magnitude -2.01 with a slight variability and an orbit of over 600 years so little is known about the orbit. This star is one needing more study.

Featured Messier object – M97, NGC 3587, The Owl Nebula was discovered in 1781 by Pierre Mechain

and added to the Messier catalog that same year. It has about the same angular size as the planet Jupiter; however, it will take a moderate size telescope to make out the two lighter ovals representing the eyes. In a small scope The Owl Nebula has a bluish diffuse disk and not much else. In a larger scope at around 125x the two lighter patches become visible and the nebula more resembles an owl. An O-III filter makes the nebula brighter but does not help much with seeing. It takes a rather large scope in the 18" size to resolve the central star.

Featured constellation – Leo Minor, the Small Lion is a faint diamond of stars located above Leo and between the legs of Ursa Major, the Great Bear on the west and Lynx, on the east. It was introduced in the late 17th century by Johannes Hevelius to fill a gap in the sky above Leo. It is most noted for 10 galaxies on the Herschel 400 list which I am currently in the process of observing. NGC 2859 is a barred spiral with a bright elongated center and a faint halo surrounding. It is located directly west and slightly north of alpha (α) Lynx a 3rd magnitude star located at the SW tip of the constellation. Only 9 more galaxies to go in Leo Minor.

Although small this constellation contains a storehouse of objects for the deep sky observer. Have fun.

Other objects of interest – Starting at the last leap of the gazelle (Talitha), iota (ι) UMa the front paw of the bear go 3° NE to NGC 2841 a spiral galaxy at least twice as long as it is wide and there is a bright central area slowly fading to the edge. The Hubble space telescope has taken a beautiful detailed picture of this galaxy with the new Wide Field Camera 3. Go to Merak beta (β) Uma the bottom right star of the big dipper. From Merak go 1½° SE to M108 (NGC 3556) an edge-on spiral with quite a bit of detail. Continue less than 1° SE to the Owl Nebula, M97 (NGC 3687) a planetary nebula with two dark spots looking like eyes. Again from Merak go 10° WNW to upsilon (υ) Uma then 1° W to NGC 2950 a dim oval galaxy but easily resolved with an 8" telescope. Just 4° WNW from here is NGC 2768 and NGC 2742 both ovals resolved with an 8" telescope.

Enjoy the night, enjoy the view

Bill Shackelford

Celebrating 40 Years of Discovery and a Bright Future at the Canada France Hawaii Telescope (CFHT)

Tuesday, April 13th at 7:00 pm EDT



Join Doug Simons, Executive Director of the Canada-France-Hawaii Telescope to explore this incredible observatory from its instrumentation and historic scientific discoveries to its outreach efforts in Hawai'i and the world at large. The observatory hosts a world-class 3.6 meter optical/infrared telescope and is located atop the summit of Maunakea, considered by astronomers to have the best seeing conditions on Earth. A few of its seminal observations include supporting the discovery of Dark Energy, the first cosmic gravitational lenses paving the way for mapping Dark Matter, the tracking of the first interstellar asteroid 'Oumuamua, and many others. CFHT's overall science impact is ranked second worldwide and typically over 200 research papers per year incorporate CFHT data. It has remained competitive due to its dedicated staff, innovative and novel instrumentation, and its willingness to take risks. CFHT has plans for a quantum leap in instrumentation that will be discussed in Dr. Simons' presentation – including ones that might allow for detection of life on exoplanets, large-scale galaxy surveys, and exploring the origins of the universe in new ways.

Doug Simons received his B.S. in astronomy at the California Institute of Technology in 1985, and a Ph.D. in astronomy at the University of Hawai'i in 1990. He is an astronomy veteran in Hawai'i, having spent most of his entire professional career either observing with or working for various Maunakea observatories. He attended the University of Hawai'i's Institute for Astronomy from 1986-1990, specializing in infrared instrumentation and research on brown dwarfs and the Galactic center. In 1990 he joined CFHT as a resident astronomer, where he stayed through 1993. While at CFHT, Doug was responsible for developing the "Redeye" near-infrared camera systems, which were the first near-infrared facility cameras available to the CFHT community. He joined the Gemini 8-m Telescopes Project in Tucson, Arizona, in 1993, where he focused primarily on Gemini's instrument development program before serving as Gemini Director from 2006-2011. Doug rejoined CFHT as Executive Director in 2012 and has overseen a number of new instrumentation additions to the observatory. Beyond his passion for astronomy, Doug enjoys upland game bird hunting, fishing, and woodworking.

Reserve your place for this special Zoom presentation by emailing planetarium@maine.edu
