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Penobscot Valley Star Gazers

An Astronomical Society of Central Maine

January 10
1946: U.S. Army bounces radar signal off the Moon.
1969: Venera 6 launched.

Happy New Year
January 2022

January 2022!

The PVSG will meet remotely via Zoom on Monday, January 10, 2022 at 6:30 pm (Meeting ID 862 9984 6478 Password: PVSG). Doors will open around 6:00 for some socializing before the meeting. We do not know what the program will be.

Thanks for last month's program go to Scott Burgess for his talk "Teaching Astronomy During COVID."

Remote Astronomy Class

PVSG Monthly Meeting Minutes
December 13, 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 videoconference. The business meeting was brought to order by Don Ferrell at approximately 6:30 PM.

Attendance:

Members Online:

Don Ferrell - President
Andy Brown – Vice-President
Dwight Lanpher – Club Liaison & Member - at - Large
David Clark – Treasurer
Phil Normand – Secretary
Scott Burgess - Presenter
Bill Shackelford
Mary-Frances Beesorchard
Don Krause
Dale & Julie Brownie
Alan Davenport

Presentation

Scott gave a presentation on "Teaching Astronomy during COVID."

Scott spoke of his difficulties teaching high school astronomy during COVID. The two courses he teaches are separate and can be taken independently. Scott states that he is passionate about sharing how awesomely big and old the universe is, as well as how awesomely beautiful it is. Scott teaches about many types of objects in the universe, the theories used by scientists to make sense of their observations and the methods used by astronomers to develop those theories. Scott teaches about technology including as much cutting edge technology as possible. Scott tells his students that doing science is a human endeavor and that the students can get involved with citizen science through programs like Zuniverse.

In normal times, Scott would teach the course from a project based perspective rather than focusing on tests and quizzes. This gives the students a more hands on experience including a star party each semester. Scott has used paper labs as well as simulated labs on computer. Imaging has also been a part of the course and students in the past would come to Scott's home observatory. With COVID, Scott and many of the students were out of the classroom learning remotely for some or all of the course. This was true for the international students who were connecting from overseas. The students didn't have access to the computers to run the lab simulations. Scott needed a way to have a virtual star party. This would require students to Zoom in after hours and Scott would need a way to display objects that he would image from his home location. He was able to acquire a 17" dobsonian mounted reflector that gives impressive views but is not a Goto type of scope. The school was able to fund the purchase of a Vixen Cassegrain telescope and Scott purchased a SkyWatcher goto mount to pair with it. The school also purchased a Mallincam Skyraider DS 10C video camera for taking deep sky images. It has high resolution at 32 frames per second and at lower resolution can image at 100 frames per second. Scott showed some of the images taken during a virtual star party. He showed how the students could manipulate the images using free software to enhance different details of the images. Students also used images taken of the moon for lunar topography, and images of solar system objects. Atmospheric turbulence was cut down by using a CCD camera and very fast exposure times. Image processing was done using a free program called Registax which was easy enough to learn and use in a single class session. Students used raw AVI files acquired through an internet file sharing service to study

the moon's topography in detail. Students were also able to use Slooh online through a grant acquired by Shawn Laatsch. Shawn also taught the students how to use the Slooh online environment to observe objects.

Scott felt that students did get some experience observing even with COVID. As a first attempt, Scott felt virtual star parties worked well. Scott hopes that a continued partnership with the University and with Slooh will be possible. Scott is grateful for being able to teach in person this year.

A question and answer session followed with Scott giving more detail about the challenges in teaching students during this time.

Secretary's Report and Acceptance of Minutes

The November Meeting Minutes were not discussed at the meeting.

Treasurer's Report

Dave was again having internet connection problems. Andy reported our current balance is $649.37. He also reported that only 12 members have renewed their memberships. Dues are now due and checks should be sent to Dave Clark 609 Cape Jellison Road Stockton Springs 04981.

Observing Reports:

Dwight conducted a star party with the Astronomical Society of Northern New England at their Starfield Observatory in Kennebunk, ME for a group of 12 to 15 girl scouts. It was quite cold and the girls stayed till 6:30. The girls looked through the 16" observatory scope and Dwight used his Stellina to display images to his iPads, but they got too cold. **Dwight** was able, however, to display images on his iPhone. **Bill** gave a presentation on astronomy and the Night Sky Network to 24 people at the local historical society this past Friday. **Julie & Dale** viewed Jupiter and Venus. They saw 3 moons of Jupiter and the phase of Venus. **Don** has been looking at the moon with his 8" dob. **Bill** mentioned that tonight is the peak of the Geminid meteor shower with up to 24 meteors per hour. **Bill** also mentioned that Slooh will be showing them online through one of their facilities.

Old Business

There was no old business discussed.

New Business

Andy mentioned that there was a program on 60 minutes about the James Webb Telescope launching later this month. The group discussed the Hubble and JWST telescopes and their differences. Dwight mentioned he just received his RASC Observers Handbook for 2022. Phil said he purchased one at the BAM bookstore in Bangor. Scott asked if we wanted to pursue getting permission to meet at John Bapst. Don mentioned that we should continue to meet by Zoom till Spring.

Adjournment

The meeting was adjourned at approximately 8:00 PM

Phil

Observe The Sky This Month

Some Selected Objects

January 2022

General sky comments – Since the solstice of last month the Sun has been rising late and setting only slightly earlier. That is about to change. If you have been paying attention you will have already noticed the later setting Sun. Rapid changes with the Sun will happen this month and continue for the next few months. On the 4th of this month the Sun arose for the latest time this year. Until then the amount of daylight had hardly changed since the solstice. The late rising Sun had kept the day short although the setting Sun had been later each day. By the end of this month the amount of daylight will have increased by less than 1 hour but by the end of February well over an hour. In March daylight savings time will begin.

Planets this month –The new moon (lunation 1225) was on Sunday the 2nd, first quarter was on Sunday the 9th before the meeting on Monday the 10th, full moon is on Monday the 17th, and last quarter is on Tuesday the 25th. Mercury began the year in the evening sky trailing the Sun by 18° at mag. -19. It reached greatest eastern elongation of 19.2° on the 7th. It is also moving quite quickly and will not be visible for very long this month. Look for Mercury and Saturn to share a wide binocular field on the evenings of the 10th through 15th. After these dates Mercury rapidly becomes obscured by the Sun. Venus was only 13° from the sun in the evening sky on the 1st. On the 8th it made the closest approach of any planet to the Earth in over a century. It was 133 light seconds (0.2658 AU) from Earth. Mars is in the morning sky shinning at mag. +1.5 continuing to emerge from behind the Sun. It is located in Ophiuchus early in the month moving into Sagittarius for the second half of the month. A waning crescent Moon passes 2°to the south on the 29th. Jupiter begins the year easily visible low in the southwest sky. The waxing crescent Moon passes 4°to the south on the evening of the 5th. Saturn can be seen low in the southwest evening sky early in the month at the beginning of the year and is lost in the glare of the Sun by mid-month. Uranus (Οὐρανός) is in the constellation

Aries and well placed for telescope viewing in the south. It is 15°north of the celestial equator at mag. +5.7 and visible to the naked eye from a dark site. Neptune is in Aquarius and visible with optical aid. Pluto is too close to the Sun to be observed.

Constellations for the month – Low in our sky at this time of the year and easily observed is the small constellation of Lepus, the Hare. (See below.) To the left of Lepus is the constellation of Canis Major. We will concentrate more on this constellation and its bright star Sirius next month. Notice Sirius was directly south at midnight on New Year eve. Immediately above Lepus is one of the best known constellations Orion, the Hunter. Orion, the Hunter was to the Greeks and Romans a giant of a man who could walk through any depth of water and not get his head wet. He had no fear of any animal and threatened to kill all the animals on the Earth. When Gaia the goddess of the Earth heard this she became angry and sent a scorpion to kill Orion. He was gravely poisoned but Aeschulapius/ Ophiuchus the founder of medicine saved him by administrating an antidote. All three are memorialized in the sky and this is why Orion and Scorpius are in opposite parts of the sky with Ophiuchus standing above the scorpion with it under his foot. Many cultures had various names for the giant usually referring the pattern of stars to someone of importance. Orion contains three Messier objects, M42 (NGC 1976), M43 (NGC 1982), and M78 (NGC 2068). M42 is the Great Orion Nebula perhaps the finest diffuse nebula in the sky. If you have observed this diffuse nebula before observe it again because there is always something you missed before. M43 is located next to M42 and probably part of M42 being only separated by an intervening dust lane. Taken together and viewed with a wide field view the two resemble some giant bird soaring through the sky with its wings outspread. The two should be observed with a low F stop telescope with a lot of light gathering power and a field of view of at least 2 degrees. M78 is an emission and reflection nebula located 2½° NNE of Alnitak, zeta (ζ) Orion the eastern star in the belt of Orion. Not as spectacular as M42 or M43 it is unique in its own way and should be observed. Orion contains numerous other multiple star systems many listed at the end of this article. Most of them are blue-white stars because they have been recently born in the Orion Complex. I will let you discover others on your own. Higher in the sky directly above Orion is the constellation of Auriga, the Charioteer. Auriga has numerous mythological stories connected to it. Capella the alpha (α) star of Auriga is the sixth brightest star in the sky and the third brightest in the northern hemisphere. Only Vega in Lyra and Arcturus in Boötes are brighter. Auriga is usually shown as a man in a kneeling position sitting on a bench (the Milky Way?) holding a female goat with two kids under his right arm and he is holding reins and a whip in his left hand. This is the view seen on a typical celestial globe but Auriga is also shown the other way. Depending on the civilization Auriga is a charioteer, a rein holder or other type of driver, goat herder, or driver of some vehicle (wagon, cart, etc.). Auriga contains three Messier objects M36 (NGC 1960), M37 (NGC 2099), and M38 (NGC 1912) all open clusters. We must note the easiest way to find and observe the first object M1, (NGC 1952) on the not comet list of Messier. The star which one might think to be the bottom star of Auriga is not. Rather it is the northern of the two stars forming the tips of the horns of Taurus, the bull, a constellation we observed last month. The brighter star has a name Elnath and is the beta (β) star of that constellation. The other star zeta (ζ) Taurus is the guide star to M1. Once you have found this star, M1 is just over 1° NW. Until 1930 when the constellation boundaries were fixed the star Elnath was also the beta (β) star of the constellation Auriga, the Charioteer.

Featured star – Hind's Crimson Star is a variable carbon star R Leporis found 3½°WNW of mu (μ) Lepus. It was discovered in October of 1845 by John R. Hind of London. It is one of the most vivid red stars in the sky and varies between magnitudes 6 and 11.5 over a period of about 430 days. This magnitude difference corresponds to an actual difference in brightness of 300 times. Like other carbon stars R Leporis is most red when it is at minimum brightness. Its spectrum has very strong bands of carbon which makes it a strong absorber of blue light. It is also very cool with a surface temperature of 2600°Kelvin or less.

Featured constellation – Lepus, the hare. Lepus contains one of the few winter globular clusters M79. To find M79 go 4°SSW of the 3rd magnitude star Nihal, Beta (β) Leporis. Note Lepus is a hare not a rabbit. Lepus was changed, according to myth, by Ostara the goddess of spring from a bird into a hare that can run as fast as the bird could formerly fly. Hares are noted for their rapid running, being born with eyes open, and a coat of fur. Ostara did allow Lepus to once again lay eggs one day a year. The word Easter is derived from the word Ostara and the pagan custom of decorating eggs at the vernal equinox dedicated to Ostara the goddess of spring. As this small constellation has such a southern declination it is best seen in Maine when it is directly south.

Featured Messier object – M78, NGC 2068 is a fan shaped bright bit of nebulosity found 2½° NNE of Alnitak, Zeta (ζ) Orionis. Embedded within are two 10th magnitude stars. It has a sharp northern border fading southwest into a fan shape. The two stars resemble a Halloween costume of a sheet draped over a child with two eyes staring out. To some it also resembles a double headed comet. No wonder Messier added it to his catalog as number 78.

Other objects of interest – In Orion, NGC 1788 a mixture of emission and dark nebulae similar to M78 located 5° NNW of Rigel, NGC 2024 the flame nebula, NGC 2022 a planetary located 2° SE of lambda (λ) the center star of the naked eye open cluster forming the head of Orion. (Not as good as the Pleiades but worth observing.) In Auriga, NGC 1907 a little jewel of an

open cluster ½° SSW of M38, NGC 1931 a diffuse nebula 1° slightly north of east from M36, NGC 1857 an open cluster with three bright stars, less than 10 dimmer stars, and up to 40 even less dim stars depending on the size of your telescope found less than 1° south of lambda (λ). Also in Auriga NGC 1664 2° east of epsilon (ε) an open cluster with strings of stars resembling a flying kite, NGC 2126 an open cluster halfway between Menkalinan, beta (β) and delta (δ) the top star of Auriga an open cluster of about 30 stars including one bright star. NGC 2281 an open cluster of perhaps 30 stars with around a dozen brighter located 1° SW of psi (ψ^7) one of the stars in the "reins" of Auriga. If you are game look for the "Horsehead Nebula" Barnard 33 located ½° SSE of Alnitak. You will need excellent sky transparency, a telescope of at least 12", and an O-III filter which will greatly help. I have tried several times and have yet to detect it with my 12" telescope at a very dark viewing site. Another challenge object is the Witch Head Nebula (IC 2118) a reflection nebula located west of Rigel in the constellation Eridanus the River. It is illuminated with the light from Rigel and you do not need any filter. You do need a wide field big binocular or a low power wide field telescope. With a bit of imagination it does look like a witch head in profile with a long nose and chin. It is as easy to see as the Orion nebula with no bright stars, only Rigel illuminating the profile.

Bill Shackelford

When you cannot observe the stars. Observe the Moon.