



Penobscot Valley Star Gazers

An Astronomical Society of Central Maine

<http://www.gazers.org>

Buttercups nodded and said "Goodbye!"
Clover and daisy went off together,
But the fragrant water lilies lie
Yet moored in the golden August weather.
- Celia Thaxter



August 2021

We would like to offer our condolences to Dave and his family for the loss of Ann.
She will certainly be missed by her entire community.

PVSG at JBMHS

The PVSG returns to John Bapst Memorial High School for the August 2021 meeting on Monday the 9th at 6:30 pm. A Zoom connection will be available for those who still need or choose to attend that way. This month Don is planning to discuss options about the Meade LX 200 scope that has been donated to us.

Thanks for last month's program go to Shawn for hosting the meeting at the planetarium and presenting a show.



Big Telescopes

PVSG Monthly Meeting Minutes
July 12, 2021
Live & 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.

The presentation described the research being done on cutting-edge telescopes in the remote mountains of Chile. The film introduced us to several of the people who work to keep these telescopes operating day and night to unlock the secrets of the universe. Video tours of the ALMA, VLT and the new Vera Rubin Observatory were shown.

Meeting:

Call to Order and Welcome to Visitors

The meeting was held at the Versant Power Astronomy Center and joined by Zoom video-conference. The meeting was called to order by Don Ferrell at approximately 7:10 PM.

Attendance:

Members at Planetarium:

Don Ferrell – President
Andy Brown – Vice President
Dwight Lanpher – Club Liaison & Member-At-Large
Phil Normand – Secretary
Shawn Laatsch - Presenter
Alan Davenport
Ralph Foss
Ralph Mallett

Members Online:

Wade & Donna Smith
David Clark – Treasurer
Bill Shackelford
Julie & Dale Brownie
Jill McDonald

Programs and Astro Shorts

Program:

Shawn gave the evening's presentation on "Big Astronomy – People, Places and Discoveries".

Secretary's Report and Acceptance of Minutes

The June Meeting Minutes were unanimously accepted.

Treasurer's Report

Dave reported that for the month of June, our account had a total of \$394.37. The Treasurer's report was unanimously accepted.

Observing Reports:

Observing reports were skipped this month since it was difficult for members online and those present at the planetarium to hear each other speaking.

Old Business

Dr. Nirav D. Shah replied to an inquiry about sharing eye pieces at star parties. He said that the risk of fomite transmission of COVID-19 via telescopic eyepieces is low. He did say that using hand sanitizer prior to viewing and touching an eyepiece as well as wearing face masks, particularly among un-vaccinated viewers is recommended.

Dwight is now the Member-At-Large as well as Club Liaison.

New Business

A request was made to the group from Sarah Raymond, Lead Flight Director at the Challenger Learning Center. She asked if someone

would be available on Monday, August 2nd from approximately 10-11:30 to give a presentation on the Sun and Sunlight. There will be 12 students in two groups of 6. Shawn said he might be able to attend and bring a sun-spotter to show the kids a projected image of the sun.

Follow up: After the meeting an email was sent to the group to see if anyone else might be available to help Shawn; John Schuster replied that he could assist.

Dave received a letter from a retired U. Maine history professor who is disposing of his astronomical gear and many astronomy related books. Dave sent the group a listing of the books and gear. Since the scope's electronics are not operational, a discussion was held to see if it was worth spending money to try and fix the scope for the club's members to use. Alan noted that he still had a scope in his garage that was donated years ago.

Phil mentioned that Dwight is working on a New Member Welcome Package based on information from the ASNNE group.

Adjournment

The meeting was adjourned at approximately 7:45 PM and then Shawn presented the evening's program.

Phil



Observe The Sky This Month Some Selected Objects August 2021

General sky comments – Once again it is August. The “dog days” of summer. The Dog Star Sirius and its “heliacal rising” has happened and we now see the first hint of the coming winter with the winter constellations making their appearance in the early morning sky. The Nile River is about to flood. Oh I forget! The Nile no longer floods. The Aswan Dam eliminated that. The Perseid meteor shower peaks on the night of the 12th and 13th, however; the first quarter moon interferes somewhat the first part of the night. There are sufficient meteors in the Perseid shower to give a good show the complete night and the Perseid radiant is well placed. Get out there and enjoy the Perseid meteor shower. The lunation numbers I have been giving are based on the Brown lunation numbers begun by Ernest William Brown on the new moon of January 17, 1923. This was described with his *Planetary Theory* of 1933.

The Moon and Planets this month – New moon is

on Sunday the 8th (lunation 1220), first quarter moon is on Sunday the 15th, full moon is on Sunday the 22nd, and last quarter is on Monday the 30th. Mercury is at superior conjunction on the 1st. Then Mercury pulls away from the sun becoming visible in the evening sky where it has an extremely tight conjunction with Mars on the evening of the 18th. They both are located at 16° from the Sun. Mercury is at mag. -0.5 and Mars is mag. +1.8 making them best seen (carefully) with a telescope in the hours before sunset. Venus is poorly placed in the early evening sky. Mars continues to fade in the early evening as it approaches the October opposition. The close conjunction with Mercury can best be seen in the daylight sky. Use extreme care. Jupiter is at opposition on the 20th. It will be 33 light-minutes or 4.01 au from Earth and will be mag. -2.9 with a 49.1” disk appearing 14° south of the celestial equator. Jupiter is also in retrograde passing from Aquarius back into Capricornus. The full Moon passes 4° south on the 22nd. The Jovian satellites are also at their largest making it a good time to observe them and attempt to observe surface features. Saturn is at opposition on the 2nd. It will be 74 light-minutes or 8.933 au from Earth and will have an 18.6” disk appearing 18° south of the celestial equator. The rings will span nearly 42”. Saturn is also in retrograde but in Sagittarius. The waxing gibbous Moon passes 4° to the south on the 22nd. Uranus is in Ares, the highest it has been since the 1960s and visible most of the night. Neptune is in Aquarius, rises in mid-evening and is visible with a telescope the remainder of the night. Pluto is in western Sagittarius. Several finder charts are available to help you find it.

Constellations for the month – In August we start our journey on the deep southern horizon out of the Milky Way in a portion of the sky less populated with stars and deep space objects. As we progress northward the Milky Way is once again crossed and a number of interesting objects are seen. Our journey begins on the southern horizon with an invented constellation Microscopium, the Microscope. It is one of fourteen small constellations invented by Nicholas Louis Lacaille to fill gaps between larger constellations. Most of the constellations commemorate scientific instruments invented during the European Enlightenment. Microscopium does not remotely resemble a microscope and the brightest star is magnitude 4.5. It is one constellation you cannot feel bad about missing. Above Microscopium is the zodiac constellation Capricornus, the Horned Sea Goat, a moderately large but not very interesting constellation. It appears the Greeks made up a story for this constellation they inherited from the Babylonians. To them this constellation represented their god of fresh waters, Enki. It does resemble a two prow boat such as may be found to this day in the Near East. The Greek story was the goat-hooved god Pan was being chased by the wind monster Typhon. Pan leaped into the Nile to escape and was turned into a goat headed fish. The two stars Algedi (α) and Dabih (β) at the NW corner of Capricorn represent the horns of the goat. Both stars are class G stars that have

ceased fusing hydrogen in their cores and have begun moving off the main sequence. Algedi is a naked eye double but not a true double rather an optical pair the two stars being 460 light years distance from each other. Dabih is also double and both components can be seen with a binocular. Both stars are complicated systems but these companions need to be separated with a telescope. Capricorn contains a fair number of galaxies but most are not very bright. The only showcase is the globular cluster M30 (NGC 7099). At magnitude 7.3 M30 is easy to find 3° east of the middle star zeta (ζ) on the eastern side of the constellation. In small telescopes M30 has a central core of unresolved stars and a surrounding edge of almost resolved stars. There is a 7th magnitude star not far to the east of the core. In larger telescopes stars in the core can be seen twinkling in and out of resolution depending upon sky conditions. Under ideal conditions a large telescope shows lines of stars radiating from the center making it resemble a horseshoe crab. A trio of stars 3½° SSW of beta (β) Cap are interesting to observe. The top star in the group rho (ρ) cap is a complicated system of four stars of various colors visible in binoculars and small telescopes. The western star Pi (π) is a triple star best seen in a larger telescope. The other star omicron (ο) in the group is also double and seen better in small telescopes. Above Capricorn is the western portion of the constellation Aquarius. This constellation is a fall constellation and will be observed with more detail next month. For now we will observe a few interesting objects in Aquarius directly above Capricorn. Start at Algedi (α) Cap, then go 8½° west to M72 a globular cluster in Aquarius. This globular is not very bright but should be observed as a Messier object. Very near to M72 is one of the unusual Messier objects along with M40 and M24 Messier put in his list. This object is M73 a group of 4 stars in a grouping resembling an arrowhead. To find it go only 1° W of M72. This group is listed as a star cluster but one of the smallest you will ever see. Messier said there were 4 or 5 10th magnitude stars nearby but there appear to be none he would have been able to observe. M73 has an NGC number NGC 6994. Nearby is NGC 7009 the Saturn Nebula 1½° NE of M73 or 2½° ENE of M72. It is a planetary nebula about the size of Jupiter in a telescope and resembling the planet Saturn. North of Capricorn through the small western section of Aquarius we come to the small constellation of Equuleus, the Colt. Equuleus is the second smallest of the constellations. Only Crux the Southern Cross is smaller. It is the newest of the ancient constellations and was invented by Hipparchos the Greek astronomer and discoverer of the precession of the equinoxes. Hipparchos called it the Fore Part of a Horse. The four main stars of Equuleus form a trapezoid of faint stars. There are no myths associated with it and no bright interesting deep space objects. Continuing on north we finally come to a bright constellation Cygnus, the Swan and the 1st magnitude star Deneb the last star in the summer triangle. Cygnus will be our featured constellation. Continuing past Deneb we come to the constellation Cepheus, the King. I imagine Cepheus as a giant head with a big nose and

a pointed crown. Others see it as a house. Cepheus is also a fall constellation and will be covered later.

Featured star – Deneb Algedi, delta (δ) Capricorn, “the kid’s tail” is similar to Vega but has been classified as A6 because of ionized calcium II lines, F2 dwarf because of hydrogen lines, F5 giant because of metal lines, and Am because of absorption lines of most metals. Metallic-line A-type stars (Am) have close companions slowing down the rotation rate of the primary star but delta had a rapid rotation. In 1905 it was suspected to have a companion and in 1836 it was discovered with a period of 1.023 days. Then in 1956 it was pronounced to be an eclipsing variable. Upon later observation the companion was suspected of being an active star causing some of the observed variations in the system but this has not been confirmed. Other observations have added more mystery to the system. To date the nature of the secondary is not known for certain adding even more mystery to the nature of Deneb Algedi, delta Capricorn.

Featured Messier object – M29 (NGC 6913) is an open cluster in Cygnus consisting of about 50 stars the brightest dozen or so forming a figure resembling the big cooling tower of a power plant. It is easily recognized in the telescope view but is not a spectacular open cluster. M29 is found 2° south of Sadr, gamma (γ) Cyg the middle star of the cross forming the constellation. The other Messier object in Cygnus is M39 (NGC 7092) an even less interesting open cluster than M29. It is a large loose collection of 50 stars twenty of them bright but forming no definitive figure. Find M29 9° NE of Deneb or 3°N of rho (ρ) Cyg. Observe both of them as Messier objects to put on your list.

Featured constellation – Cygnus, the Swan represents the swan Jupiter turned himself in to seduce Leda the wife of Tyndareus King of Sparta while she was bathing in a pool. Leda had twins Pollux and Helen from this affair. Tyndareus conceived Castor and Clytemnestra later on the same night so Castor was not immortal. Leda must have had non identical quadruplets. What a dysfunctional family. Helen found fame as Helen of Troy and Clytemnestra married Agamemnon all involved in the Trojan War. Castor and Pollux joined Jason and the Argonauts. Cygnus is in the most beautiful part of the Milky Way and consequently contains many objects of interest. We will look at the objects I have observed and hopefully you will find interesting. We have already discussed the two Messier objects M29 and M39. One of my favorite objects is the Veil Nebula, an old supernova remnant. It is commonly divided into three segments because it is so large. The entire nebula may be observed with a large binocular such as an 8X50 but if you have a wide field telescope or a 25X100 binocular each segment can be observed individually. An OIII filter or a UHC filter will bring out the details. It must be observed at a dark site because it is rather dim. It is found 3° SSE of epsilon (ε) Cyg. 3° SW of the Veil is open cluster NGC 6940, a large impressive open cluster with a mixture of 125

bright and dimmer stars. Do not use high power or you may have trouble finding it. Messier missed this one GREAT cluster. Immediately SE of Deneb (α) Cyg is NGC 7000 the North American Nebula, an emission nebula best observed the same way as the Veil. To the east of this nebula is the Pelican Nebula IC 5070. This emission nebula appears as a separate nebula but is likely the same nebula separated by a dust band. From xi (ξ) Cyg the 4th mag. star on the west side of the North American Nebula go 4° WNW to NGC 7062. This nice little cluster consists of a dozen brighter stars and maybe 50 dimmer background stars. From NGC 7062 go 2° NE to M39 which we have talked about earlier. From there go 3° north to NGC 7086, an open cluster of 6 or 7 bright stars over a background of maybe 40 more stars. From NGC 7086 go 5½° NW to NGC 7008, a planetary nebula called "The Fetus Nebula." It does not take much magnification to see why it is so named. NGC 6910 is an open cluster next to Sadr gamma (γ) Cyg the star at the heart of the swan. It is ½° north. NGC 6910 is known as the "Stick Man" cluster although I could never find the "Stick Man" figure, maybe you can. It contains a total of about 50 stars.

There is nebulosity in this cluster best seen at low power. From Deneb go down the west "wing" of the swan past two 4th mag. stars omicron (\omicron) 1 and 2 to iota (ι) the first of two stars at the end of the wing. On the way you passed NGC 6826 a planetary nebula. Did you notice NGC 6826? If not go 3° SE of iota to this "blinking planetary." I have not observed the blinking phenomena but I have been told you look away from the planetary with averted vision and the background nebula can be seen. Then you look at the planetary and the background nebula disappears. Most observers have observed Albireo, beta (β) Cyg, the star at the nose of the swan with its contrasting stars of yellow and blue. Observe Alberio again and then go 5° WNW to find NGC 6834, an open cluster of about 60 stars surrounding a 9th magnitude star. Use low power to find a line of 5 or 6 stars in a row and then use higher power to better resolve the dimmer cluster of 50+ more stars. This is probably the most difficult to find of all the objects this month.

Bill Shackelford
Summer seems long but it will soon be gone.