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Penobscot Valley Star Gazers

An Astronomical Society of Central Maine

Jams, and jellies, and juices,
Ready for all sweet uses.
-M. E. B.

August 2023

August Meeting

The next meeting of the PVSG will be held by Zoom on Monday August 14th at 6:30 pm. (Zoom meeting ID 862 9984 6478 Password: PVSG.) Bill says he has a short presentation on the Europa Clipper spacecraft nearing completion and scheduled for launch in October of 2024. It includes a video and information on how we can support the mission and send our names with the spacecraft to Europa. He has already signed on and will show what you get for signing on.

Thanks for last month's program go to Don F. for a YouTube piece on the best 100 images from the Hubble Telescope.

PVSG Monthly Meeting Minutes
July 10, 2023

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 meeting was brought to order by Don Ferrell at approximately 6:45 PM.

Attendance:

Online:

Don Ferrell – President
Don Krause
Wade and Donna Smith
Scott Burgess
Ralph Mallett
Jeff Cunningham
Dave Clark – Treasurer
Bill Shackelford

Presentation

Don F. presented a YouTube program on the best 100 images from the Hubble Telescope.

Secretary's Report and Acceptance of Minutes

The minutes for the June meeting were accepted unanimously.

Treasurer's Report

Dave stated that $340.97 was in the treasury last month. Dave has paid our astronomical league dues but the check has not yet been cashed.

Club Liaison Report:

No report this meeting.

Observing Reports:

Don reported lousy weather in Bucksport.

Old Business

Don mentioned that we are still looking for officers. Dave mentioned that Andy can no longer serve as Vice-President so we need someone to volunteer for that position. Ralph asked if the by-laws mention anything about the Member at Large filling in for a missing officer.

New Business

A brief discussion of this year's annular eclipse and next year's total eclipse took place. A discussion of our dues and what we use the money for that we collect. Don K. mentioned that the Northern Lights were supposed to be visible late in the week. Jeff talked about a spot in Plymouth that he has found that might be good for astrophotography. Dave asked if we are going to try to have Star Parties with the public again. Dave polled the group and Don K and his wife said they would host a star party at their house in Levant. Dave asked if they could just send an email when they want to host.

Upcoming Calendar of Events

Maine State Star Party at Cobbscook Bay State Park on August 12th.

Adjournment

The meeting was adjourned at approximately 8:25 PM.

Phil

Observe The Sky This Month

Some Selected Objects

August 2023

General sky comments – This month has two full Moons both super Moons. The first was on the 1st and known as the Sturgeon Moon. The other will be on the 30th and is known as the full Blue Moon (The second full Moon in any month.) The Perseid meteor shower peaked on the morning of the 13th with the Moon a waning crescent of 8% in Gemini. Saturn will appear slightly brighter this year at opposition than last year for two different reasons. One, it is closer to Earth this year and two, the planet will throw no shadow on the rings making it appear brighter through the "Seeliger effect". (The brightening of a rough surface.) A more detailed explanation of this effect is found in the August issue of Astronomy magazine, page 36. The 3-D effect caused by ring shadows is also eliminated.

The Moon and Planets this month – Full Moon was on Tuesday the 1st and the last quarter was on Tuesday the 8th both before the PVSG meeting on the 14th. New Moon (lunation 1245) is on Wednesday the 16th, first quarter is on Thursday the 24th and the second full Moon of August is on Thursday the 31st making it known as a "blue" Moon. Mercury achieves the greatest elongation of the year east of the Sun on the 10th at 27°. Unfortunately it is not well placed for viewing unless you are in the Southern Hemisphere where Mercury has the best view of the year.Venus is close to the Sun and in practice invisible to Northern Hemisphere observers for most of the month. It is closest to the Earth at 144 light seconds on August 13th and at inferior conjunction with the Sun.Mars remains in Ares for the rest of the year. The thin crescent Moon passes close on the 18th. Mars reaches mag. +1.8 the dimmest of the year and a challenge to observe in the early evening twilight. Jupiter rises close to midnight this month. Saturn is at opposition on the 27th at 73 light-minutes (8.763 au) from Earth at Mag. +0.4. The rings are exposed on the southern side at a 12° tilt and will span 44.2". The disk of the planet is 19.0" wide and 12° south of the celestial equator. Saturn is in retrograde in Aquarius. The full Moon passes 2° to the south on the 30th. Uranus (Ούρανός) rises near midnight local daylight time. Neptune is in Aquarius, rises in mid-evening and is visible with a telescope the remainder of the night. Pluto is in western Sagittarius.

Constellations for the month – In August we start our journey on the southern horizon east 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 again crossed and a number of interesting object 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 will not mind 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) see below. 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 it is a Messier object. Slightly more than one degree east of 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. 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 is listed as NGC 6994. Nearby is NGC 7009 the Saturn Nebula 1½° NE of M73 or 2½° ENE of M72. 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 1936 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 – At magnitude 7.3 M30 (NGC 7099) in the constellation Capricornus is easy to find 3° east southeast of the middle star zeta (ζ) on the eastern side of the constellation. It was discovered by Charles Messier in 1764, "below the tail of Capricorn. One sees it with difficulty with an ordinary telescope of 2.5 feet. It is round and contains no star." William Herschel (1783) determined it to be a "brilliant cluster." 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. This globular cluster is unique and should be viewed by everyone. I think you will put it on your list of favorite objects especially in larger telescopes.

Featured constellation – One of the most memorable nights I have spent at the telescope was observing this constellation. Cygnus, the Swan represents the swan Jupiter turned himself into 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 (ο) 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
August is hot and long but it will soon be gone.