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Penobscot Valley Star Gazers

An Astronomical Society of Central Maine

July 2024

Raised are the dripping oars,
Silent the boat! the lake,
Lovely and soft as a dream,
Swims in the sheen of the moon.
-Matthew Arnold

July Meeting

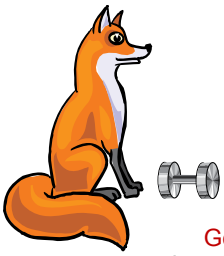
Due to the hot weather, the meeting of the PVSG on Monday, July 8th at 6:30 pm will be held by Zoom only. (Zoom meeting ID 862 9984 6478 Password: PVSG.) Bill says he will give a short presentation.

Last month's meeting was brief, and the elections were not held.

PVSG Monthly Meeting Minutes
June 10, 2024

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 June minutes were unavailable.



Observe The Sky This Month
Some Selected Objects
July 2024

General sky comments – On Friday the 5th the Moon was in descending node and obtained aphelion at 6pm EST 404,362 km from the Earth. It is most commonly known as the Buck Moon because the male "Buck" deer have grown their antlers by this time of the year. On Saturday the 13th the star Spica is 0.9° S of the Moon and Spica is occulted by the Moon in North and Central America. On Wednesday the 17th the star Antares is 0.2° S of the Moon. It is occulted in large parts of Africa and all of Madagascar. As I write this "the Blaze Star" T Coronae Borealis has not reached its maximum magnitude. Early Predictions have the star increasing in magnitude from around 10.7 to as much as 3 or possibly 2 sometime this month. It may be as late as the year 2026. Observe the area of SW Corona Borealis every chance you get and maybe you will be among the first to observe this recurring nova return.

The Planets this month – The new Moon (Lunation 1256) was on Friday the 5th before the meeting on the 8th. First quarter Moon will occur on Saturday the 13th, full Moon is on Monday the 22nd, and last quarter is on Saturday the 27th. Mercury can be seen in the evening sky all of the month. It started the month at mag. -0.6 at 18° east of the Sun. It fades a full magnitude by the 22nd when it is at greatest elongation from the Sun at 27°. Venus is slowly becoming visible in the western sky where it will become the "Evening Star". This month because of its geometry it is difficult to observe in the northern hemisphere. Mars passes from Aries into Taurus in the morning sky and it comes 0.6° from Uranus on the 15th. Close enough to observe both in the same telescopic field. Once again compare its rusty color to the nearby stars Aldebaran and Betelgeuse. Jupiter appeared 32° from the Sun on the 1st as it climbs in the early morning sky becoming easier to see. There are numerous transits of the face of Jupiter by its moons and shadows this month sometimes several at a time. Consult the internet of your favorite publication for details instead of me trying to detail all the incidents. Saturn is bright in the morning sky as it enters its prime viewing season. It is in Aquarius and the waning crescent Moon makes a very close pass on the 24th with it producing an occultation in much of the Eastern Hemisphere. Uranus (Ούρανός) appears in Taurus in the morning sky. Neptune appears in Pisces and reached its stationary point on the 3rd. It is in retrograde the rest of the month. It has a lovely light blue color when using a telescope 10 inches or above with the magnification increased. It is not dark blue as you see in published pictures taken by Voyager II. That was a filtered photo looking for surface features. While at high magnification look at the largest moon Triton. Pluto appears with difficulty in eastern Sagittarius.

Constellations for the month – The constellation Corona Australis, the Southern Crown at the Maine latitude barely clears the horizon. It is an interesting object as it looks just like a crown or a jeweled necklace a princess might wear with an arc of bright stars forming the front part of brighter jewels. A challenge object for observers in Maine is the globular cluster NGC 6723. You will need a very low southern clear and steady sky. It appears to be in Corona Australis but is actually over the border north in Sagittarius. The cluster forms a triangle with epsilon (ε) Corona Australis and the sixth magnitude star immediately west. Both stars are at the top of Corona Australis when observing this globular cluster above them in Sagittarius, the Archer with its distinctive tea pot asterism. This cluster is quite lovely and well worth your time. A fun thing to do at this point is to compare Corona Australis and its shape to a slice of lemon to put in that tea pot. You might also at this point think of the three 3rd and 4th magnitude stars above the NW corner of The Tea Pot as the bowl of a

spoon along with a 4th magnitude star about 10° W forming the handle of the spoon all ready to dip into what could be seen as a sugar bowl made of the constellation of Capricornus to the East. We will observe Capricornus next month. The Sagittarius centaur half man and half horse archer has his arrow aimed at Scorpio getting ready to kill the scorpion that killed the giant Orion. Sagittarius is characterized by its abundance of globular clusters and unique deep sky objects. There are 20 easily observed globular clusters to be observed in Sagittarius and many others a bit more difficult. The globular clusters include 7 Messier and 13+ New General Catalog entries. Sagittarius also contains 4 Messier open star clusters, 4 Messier nebulas, and 1 Messier star cloud a unique object Messier did not recognize anywhere else in the sky. There are numerous double and triple stars in Sagittarius including Epsilon (ε) a double star of white and blue-white stars separated with almost any aide aka Kaus Australis the bright star at the bottom right corner of the tea cup asterism. A few of the globular clusters you should not miss are NGC 6528 and NGC 6522 located next to each other just to the NW of Alnasl ,gamma (Y) Sag, the star located at the tip of the spout of the "tea pot". Both are visible with an 8" scope. NGC 2522 is a bit more difficult to observe being partially obscured by a dust cloud. Go back to Alnasl and then go 1¾° ESE to find NGC 6558 and ¾° E to find NGC 6569. NGC 6569 is the more difficult to observe of the two. The last globular in this area NGC 6624 is located ¾° SE of Kaus Media delta (δ) Sag the star where the spout of the "tea pot" attaches. NGC 6624 is small but bright with some stars resolved. Now go to Kaus Borealis lambda (λ) Sag the star at the tip of the "tea pot" asterism and look immediately east to find NGC 6638. Now that you are here look for M22 2° NE. M22, NGC 6656 was the first globular cluster to be identified as a globular cluster. It is truly spectacular and if it was as high in the sky as M13 it would appear as spectacular. After M22 go back to Kaus Borealis at the tip of the "tea pot". NW 1° is M28, NGC 6626, less spectacular than M22 but extremely nice. It is too bad M28 is not located elsewhere where it would get more attention. To find the rest of the Messier globular clusters go back to the bottom right of the "tea pot" and the double star Kaus Australis (ε). From this star go 2½° NW to M69, NGC 6637, do not confuse this globular cluster with NGC 6652 1° SW. From M69 go 2½° W to M70, NGC 6681, and finally go 3° NE to M54, NGC 6715 or alternately go 2° SW of Ascella, zeta (ζ) Sag the star at the SE corner of the "tea pot". All these globular clusters are not spectacular and a bit dim for Messier objects but worth observing. The other two Messier globular clusters are M55, NGC 6809 and M57, NGC 6864. M55 is a very impressive globular cluster with many bright stars over a faint small core. It is at the edge of the Milky Way so less obscured by dust clouds. To find it go 8° west and slightly south of Ascella. M75, NGC 6864 is almost in the constellation Capricornus which we will observe next month. It is completely out of the Milky Way so no Milky Way stars cover it. To find it go 12+° west of the handle of the "tea pot" to a grouping of four 4th magnitude stars. If you are already at M55 go about 6° NE of it to a grouping of four 4th magnitude stars. From this group M75 is about 5° NNE. M75 is not very bright but it has a compact core. This globular cluster is of a type known as a core collapsed globular cluster. Other objects in Sagittarius are among the favorite objects in the summer sky and include the following. M8, NGC 6523 "The Lagoon Nebula" is an emission nebula with embedded open cluster NGC 6530. It looks good in any size telescope. Use an O-III filter if you have one. To find it look for a glow 5° WNW of Kaus Borealis (γ). Above M8 1° is M20, NGC 6514 "The Trifid Nebula" an emission nebula with embedded open cluster, also use an O-III filter for best viewing. Both this and the previous nebula also look nice in a large binocular. ½° above M20 is open cluster M21, NGC 6531 an open cluster discovered by Messier while observing the Trifid. It contains about 50 stars in a compact group. 2½° NE of M21 is the star, mu (μ) Sagittarius. It is easier to find M24 the Small Sagittarius Star Cloud from this star. Use your lowest magnification or binocular to find M24 just NE of this star. It has no NGC number. This star cloud is four times the size of the full moon so looks best with a binocular. An excellent photo of M24 was the APOD feature for June 28th. Some observers list NGC 6603 a small open cluster within M24 as M24 but it is only one of several open clusters within M24. M24 is an oval grouping of innumerable dim stars 2° NE and SW long centered on a group of four 6th magnitude stars. When you observe M24 you are actually looking through a clearing in the closer interstellar dust clouds and into the more distant Sagittarius arm of the Milky Way galaxy. Once you locate these four stars and the associated cloud of stars found with them you will never forget M24. To the left of M24 and 4½° NE of Mu Sag is M25, IC 4725 an open star cluster and one of the few Messier objects without a NGC number. It is best viewed with a binocular or a small telescope but with a larger telescope many more stars are seen. 4½° west of M24 or 4½° NW of Mu (μ) is the open cluster M23, NGC 6495. With a moderate size telescope this cluster is stunning with well over 100 stars in a tight group. M18, NGC 6613 is a small open cluster 1° above the NE corner of the Small Star Cloud containing about 30, 9th magnitude stars with 5 or 6 brighter stars in the center. Do not miss this nebula. It is also known as the Omega, Swan, or Checkmark Nebula. (For more about the Mythology of Sagittarius see below in Featured constellation.) Above Sagittarius in the constellation Serpens Cauda is M17. (See featured Messier object) Serpens Cauda also contains several open and globular clusters which are on my observing list but have not been seen by me. To the northeast of M16 is the small constellation of Scutum, the Shield. Scutum, is a dim constellation formed by Johannes Hevelius to honor John III Sobieski the King of Poland who defeated the Turks when they besieged Vienna in 1683. Surprisingly the Chinese also thought this area of the sky was a shield. Because Scutum is located in the middle of the Milky Way it is full of stars and star clusters. There are two Messier objects in Scutum M11, NGC 6705 and M26, NGC 6694 both open clusters. M11 is found by following a string of stars at the bottom of Aquila to M11. It consists of a large group of stars resembling a

globular cluster but it is actually an open cluster of 100 plus stars. It is sometimes called the Wild Duck cluster because of the "V" shaped string of stars found in it. The other Messier object M26 is also an open cluster of forty stars found 3° ESE of M11. It is not difficult to recognize because it stands out well in the background of Milky Way stars. There is actually a globular cluster in Scutum located 2° NW of M26 and 2° almost due south of M11. This globular cluster is NGC 6712. Northwest of Scutum is Aquila, the Eagle one of the oldest constellations in the sky the war-eagle of the Sumerian god of war Ninurta. (See below in featured constellation for more information.) Aquila, the Eagle is mostly noted for the bright star Altair the southern star of the three stars forming the "Summer Triangle" asterism. Above Altair is the small constellation of Sagitta, the Arrow. It actually looks like an arrow and contains one Messier object, M71, NGC 6838. A globular cluster once thought to be an open cluster. Above Sagitta is the constellation of Vulpecula, the Little Fox another Hevelius creation. It is noted for the one Messier object M27, NGC 6853, the Dumbbell Nebula. The Dumbbell Nebula is located 3° north of gamma (γ) Sagitta the star considered the arrowhead. M27 is probably the finest planetary nebula in the northern sky. Also in Vulpecula is the asterism Collinder 399 aka "Brocchi's Cluster" or the "Coat Hanger". Look for the orange star in the "hook" and note its contrast with the blue stars in the rest of the cluster. NGC 6802 is a challenge open cluster at the eastern end of the "bar" of Collinder 399. With a large telescope you can see up to 40 stars in this open cluster. Above Vulpecula and to the right is the constellation of Lyra, the Lyre with the bright star Vega. Lyra contains the well- known Ring Nebula, M27, NGC 6720 located between the stars Sulafat, gamma (γ) Lyrae and Sheliak, beta (β) Lyrae. Vega is the second star in the Summer Triangle. Deneb in the constellation of Cygnus, the Swan becomes the third star. We will address Cygnus next month with all the interesting objects it contains (stay tuned). Above Lyra is the constellation Draco, the Dragon which has been addressed before.

Featured star – Alberio, Beta (β) Cygni is the most memorable double star of this Constellation and most others. The contrast of yellow and perceived blue color makes it most everyone's favorite. The name Albireo apparently has no meaning and if it ever had the name is lost in the ancient past. It does rather resemble some sort of bird name and has a cheery sound. On the other hand everyone has no trouble assigning the two primary stars colors and everyone has their varying opinions often depending on the viewing conditions. Sir William could not make up his mind calling the two red and blue in 1779, pale red and beautiful blue in 1781, red or orange and blue or purple in 1783, and yellow and blue (superb) in 1830. You can make up your own mind and not be wrong. Easily thirty plus famous observers have assigned these two stars various colors. The Washington Double Star Catalog lists over a dozen possible components to this star system and most if not all are optical companions including the two main stars. Alberio A is a class K3 giant 1,400 times more luminous than the Sun and Alberio B is a class B9.5 dwarf 200 times more luminous than the Sun. I would wager the next time you take a novice star gazer out to observe, this double will be the one they are shown if they have not observed it previously. For anyone Alberio is always one star to observe and see if your perception of the colors has changed.

Featured Messier object – M16, NGC 6618 is an emission nebula the rival of the Orion Nebula of the winter. It contains an embedded star cluster of 8100 stars. The brightest is a double star at mag +8.24. The distance to the center of star formation is approximately 5700 light-years distant less than the previously reported 7000 by earlier sources. Originally discovered by Phillippe Loys Chéseaux who observed only the star cluster in 1745 or 1746. It took Charles Messier in June of 1764 to discover the nebulosity using a better telescope. Robert Burnham Jr. named it the Star Queen because the center looked like a queen in silhouette to him. The common name is the Eagle Nebula from the center dark nebula resembling an eagle. With my 25/100 binocular I am able to see the complete nebula but it takes a larger telescope to see details. In 1995 the Hubble Space telescope observed the area and added to the understanding of the emission nebula. Most people have seen the so-called Pillars of Creation Hubble picture, an enlargement of the "eagle" formation in the center of the nebula. This observation showed small dark areas believed to be forming stars and called Bok globules. Inside and on the surface of the "pillars" new stars are forming in some areas of denser gas called Evaporating Gaseous Globules (EGG's). When the Chandra observatory imaged in the X-ray spectrum it was found the EGG's did not correspond to the X-rays of new stars. Apparently the EEG stars are not yet hot enough to emit X-rays? The Spitzer observatory in 2007 observed the "pillars" area and suggested a super nova had destroyed them and because of the distance we have not yet seen it. Since it has been found no super nova has occurred and the James Webb telescope has since confirmed this with its infrared picture of the area.

Featured constellation – Sagittarius, the Archer in Greco-Roman mythology was a half-horse and half-man Centaur. The Centaur figure early Greeks inherited from the Assyrians of Mesopotamia as they or the Babylonians before them had possibly inherited from the Sumerians as the Sumerian war god Ninurta. The two stars forming the "sting" of Scorpio the Sumerians knew as Sharur and Shargaz (also the modern name) the weapons of Nanurta laying at his feet and flying overhead is his symbol the spread-eagle. The Egyptian centaur was represented by the bottom half of a scorpion and the top half with two faces. One a man and one a Lion. This constellation [see details above] contains so many objects of interest one could spend the remainder of the summer and into the fall observing. There are still wonders I have not observed in this constellation.

Bill Shackelford
Dark skies return the night that we have lost