Penobscot Valley Star Gazers

An Astronomical Society of Central Maine

http://www.gazers.org

The mower walks with scythe in hand, to yonder field away;
The grass he prostrates over the land; how sweet the new made hay.

July 2019

July Meeting

Saturn will be approaching opposition when the PVSG meets at John Bapst Memorial High School on Monday July 8, 2019 at 6:30 pm. The program may be Scott's "Questar Adventures".

Thanks for last month's program go to Dave Clark for his talk on astronomical filters.

Better Contrast

June 10, 2019

Attendance:
Scott Burgess, Vice President
Alan Davenport
Dave Clark, Treasurer
Don Krause
Dwight Lanpher, President
Ralph Mallett
Ralph Foss
Bill Shackleford
Jeff Waring
Phil Normand, Secretary

Meeting was brought to order at approximately 6:45PM

Dwight recognized longtime member Bill Shackleford visiting from Oklahoma.

Corrections for last meetings minutes: Ralph Foss was in attendance at the May 13th meeting.

Phil proposed a standard meeting agenda for future meetings.

Treasurer's Report:

Current balance is: $363.07. The fee for club dues to the Astronomical League will be paid by end of June. Dave asked if he should send money in for the Astronomical Society for everyone or just those who have paid dues to this date. The decision was made to pay the dues based on paid membership as of the June meeting. Ralph F. asked if we should change when we pay our dues. After a short discussion it was decided that we wouldn't change when we collect dues.

Calendar review:

•Margaretta days – 6/14-15/19 Machias solar viewing; Dwight plans on attending.

•Shawn Laatsch offered to hold meeting at the Emera Astronomy Center in July or August. He also said he would help out with an observing event as well.

•Other possible summer observing opportunities:

○The Carver library in Searsport looking for a fall star party. Dave will be giving a talk, likely to both kids and adults this summer.

○Kingfield days – July 20th – Dwight looking into it.

○50th Anniversary of Apollo Moon Landing (Emera & Challenger Center)?

○Sun Fest (hopefully to be scheduled around full moon on or around 7-27-28)

○Stellafane: August 1st-4th: Wade & Donna going; Dwight going as well.

○Aug 10th: Calais International festival – may have solar viewing. Dwight will send

○Maine state star party – August 23rd-24th in Cobscook Bay State Park. Wade – potato barrel telescope presentation

○AASNE September 6-8 Starfest in Southern Maine

○Stars over Katahdin September 21st at the Katahdin Woods and Waters

○ANSF 9/25-29/19

○10/26 Star Party at Ben Phillips House in Hermon

○November – Bangor Land Trust?

The next meeting will be at John Bapst.

On the Schedule

(Items Subject to Change)

PROGRAMS

July 8 or August 12: PVSG meeting at Emera Center.

STAR PARTIES

?Sometime this fall: Carver Library in Searsport star party
?July 20: Challenger Center, Emera Center, 50th anniversary of Apollo 11 lunar landing event
July 20: Kingfield Days
?July 27 or 28: Maybe Sunfest somewhere.
July 31: Stars Over Surry
August 1 to 4: Stellafane
August 23 to 24: Maine State Star Party
September 21: Stars Over Katahdin
September 25 to 29: Acadia Night Sky Festival
?October 26: Club star party at Ben Philips'
?November 2, 7, or 9: Challenger Center star party
?November 23: Bangor Land Trust

? Tentative; (rs) rain or shine; (co) clear only; (rd) rain date

Observers' reports:

Dwight – Last Friday, he was heading to Massachusettes. Stopped at the local astronomy group there, The North Shore Area Astronomy Club in Boxwood, MA. After a short business meeting he observed with group but noticed a high level of light pollution. The following day Dwight came upon the Gloucestor Area Astronomy Club, doing what they call gorilla astronomy on the street with the streetlights on. They were able to see a few bright objects like Jupiter.

Dave – last 2 early mornings observing the Milky Way with binoculars.

Scott – Used a Questar he bought from Ralph F., and also compared 3 different Questar scopes he borrowed from Ralph and found that the optics and mirror coatings make a slight visual difference but all were very good visually.

Program:

Presentation by Dave on Filters:

Dave discussed the use of different filters for astronomy. Filters do not brighten objects but they do sharpen contrast. Dave first discussed filters for solar viewing. He discussed how some filters let light at several wavelengths through where others allow light for only a specific wavelength. Dave then talked about moon filters: fixed brightness (13% and 25%) and a polarizing filter that adjusts between 0% and 50%. Dave explained the wratten number system for optical filters. Dave showed comparisons of filters from a few years ago and gave some history on how filters have changed over the years. For the average amateur astronomer, Dave recommends UHC and OIII filters. A light pollution filter would also give you a modest increase in contrast. Dave also said that avoiding going over 10X magnification per inch of aperture is recommended when using filters. Dave shared online links for folks to get more information on filters. He also sent out an email to all members with the links.

Alan checked out the Bangor Land Trust location on Fox Hollow Road in Bangor. It appeared quite dark to the naked eye although a couple homes have been built and a light pole now sits in the cul de sac. Alan found that it is considerably darker at his house just 5 miles away. This Bangor Land Trust location may get crowded quickly with limited parking in the cul de sac. Dwight had been contacted by a lady from the Bangor Land Trust to have a star party in this location, but when Dwight called back he found that the lady no longer worked there.

Phil asked about bookmarks for the fall and gave some quotes from a local printer and it was suggested to look online, perhaps with Vista Print to get the best price. Dwight and Dave volunteered to help.

A short discussion was held about the batch of 60 Starlink satellites recently launched and what might happen to ground based astro-photography.

Meeting adjourned at 9:10

Phil

Observe the Sky This Month
Selected Objects
July 2019

General sky comments – Once again here is the month where the days slowly become shorter and the nights become longer. Unfortunately the nights take almost all month to become significantly longer. Fortunately the coming fall is one of the best times to view the sky. I recently learned about a Greek philosopher named Anaxagoras who determined by observation the moon and sun were objects and not gods. He was probably not the first to believe this but he openly expressed it. He also determined there were more than four elements, how phases of the moon happened, what causes eclipses both solar and lunar, and proposed the moon was a big rock thrown off of the early earth. All these beliefs would have been welcome for discussion in 5th century Athens except that Anaxagoras was a friend of Pericles. Pericles was in political trouble but as his enemies were unable to go after him directly they went after friends such as Anaxagoras. Consequently Anaxagoras was sentenced to death. Fortunately Pericles was able to change the sentence to exile in Lampsacus close to the Hellespont. The name Anaxagoras lives on the moon in a crater north of the crater Plato along with his beliefs. Apparently the word of the day is fortunate.

Planets this month – Full moon is on Tuesday the 16th, last quarter is on Wednesday the 24th, new moon is on Tuesday the 2nd and Wednesday the 31st, first quarter is on Tuesday the 9th. Mercury is visible in the morning sky for most of the month reaching greatest western elongation from the sun on the 19th. If you are a morning person this is a great time to observe Mercury. Venus is too close to the Sun to be observed. Mars is also too close to the Sun to be observed. Jupiter is well placed for observation in southwestern Ophiuchus. Saturn is in Sagittarius low in the south. Uranus rises late in the evening in Aries and is visible the rest of the night it is possible locate naked eye but use a telescope. Neptune is in Aquarius and visible with a telescope almost all night. Pluto is in eastern Sagittarius. Note: There are two new moons this month. If you missed observing around the first one there is always the next one. Don't forget to observe the moon.

Constellations for the month – The constellation Corona Australis, the Southern Crown at our latitude just clears the horizon. It is an interesting object as it looks like a slice of lemon. Above is the constellation of Sagittarius, the Archer with its distinctive tea pot asterism. Just NE is a group of three bright stars in a flat triangle shape along with a slightly dimmer star even further NE forming a nice spoon shape. Now we have a slice of lemon and a spoon we can imagine full of sugar to go with the tea in our tea pot. All we need now is a tea cup. Sagittarius the centaur half man and half horse archer has his arrow aimed at Scorpio getting ready to

kill the scorpion which 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 in Sagittarius and several 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. Some 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. Back to Alnasl and go 1¾° ESE to find NGC 6558 and ¾° E to find NGC 6569. NGC 6569 is the more difficult 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 nice. After M22 go back to Kaus Borealis. 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, then 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 nice 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 in 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, (see below) 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 binoculars 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 binoculars. 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 binoculars 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. Above M18 is M17, NGC 6618 an emission nebula the rival of the Orion Nebula of the winter. Do not miss this nebula. It is also known as the Omega, Swan, or Checkmark Nebula. Above and to the right is the constellation of Serpens Cauda, the Tail of the Serpent containing M16, NGC 6611 an open cluster surrounded by IC 4703, known as the Eagle or Star Queen nebula. M16 is located slightly east of 2° north of M17 in Sagittarius. This nebula contains the "Pillars of Creation" made famous by the Hubble telescope. 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. 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 (see below). 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 coarse open cluster 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 (see below). The other star in the Summer Triangle is Deneb in the constellation of Cygnus, the Swan. 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 – Altair is the signature star for the constellation Aquila, the Eagle. In Arabic the word is a combination of two words meaning "flying eagle". Hindus considered Altair one of the footprints of Vishnu along with the nearby stars Alshain (β) Aquila and Tarazed (γ) Aquila. Altair is the last of the three stars along with Vega and Deneb in the "summer triangle" to appear over the eastern horizon and is also the nearest of the stars located only 17 light years distant. Being this close Altair has been direct imaged using interferometry of the light of four 1-meter telescopes at Mt. Wilson combined producing a high-resolution image. This image shows a blue-white star 1½ times larger and 10 times more luminous than our sun. There are several brighter areas on the surface and Altair rotates once ever nine hours making it 22% larger through the equator than through the poles resulting in an equator cooler than the pole areas. The axis of rotation is offset 60° from our line of sight. Altair has at least six companion stars with the nearest at magnitude 10 actually not a member of the Altair family.

Featured Messier object – Two Messier objects popular at star parties are M8 (NGC 6523), the Lagoon Nebula and M20 (NGC 6514), the Trifid Nebula but how many have observed M21 immediately NE of M20? M21 (NGC 6531) was discovered by Messier in June, 1764 while observing the Trifid Nebula. The estimate of the distance to M21 is the same as the Lagoon at 5,200 light years. M21 at first glance might appear to be a globular cluster but it quickly becomes obvious it is an open cluster when you look for a central core of stars and find only stars. In a moderate size telescope M21 can be seen to contain only about 50 stars. In a larger telescope the formally individual stars become separate stars and the count goes up considerably to about 70 stars. The cluster is around 20 light years across with a luminosity of 20,000 suns and the brightest star a young luminous giant the cluster is likely young too.

Featured constellation – Lyra, the Lyre is noted for the bright star Vega (as noted above) one of the stars of the summer "triangle". An early form of a Lyre was a tortoise shell with strings attached across the opening and this is what is represented in the constellation. The Greeks connected this constellation with the legend of the musician Orpheus. The Babylonians thought of this constellation as the goat of the goddess Bau. Lyra is represented by a triangle of stars attached to a parallelogram of stars one of which is shared. It does look much like the tortoise shell lyre of old. The triangle of stars connected to and including the upper right star zeta (ζ) of the "parallelogram" consists of that star plus Vega, and epsilon (ε). Two of the three stars are optical doubles. Zeta^1 and zeta^2 are 4th and 5th magnitude and epsilon^1 and epsilon^2 magnitude 5. Both are nice objects for small telescopes but zeta is the most difficult. Epsilon is the most popular double-double star in the sky with each component being double. Use medium to high power to separate the secondary stars. All four stars are brilliant white stars and should not be missed. The other star at the top of the "parallelogram" is delta (δ) is also an optical double and if you have excellent vision you might be able to separate these two stars. With almost any optical help you can observe this area as an open cluster of about 15 stars known as Steph 1. The two stars at the bottom of the "parallelogram" are Sulafat gamma (γ), Arabic for "tortoise" and Sheliak beta (β), Persian for "tortoise". An interesting project to do is observe these two stars each night and compare magnitudes because Sheliak is an eclipsing variable star. Sulafat does not vary in magnitude staying a constant magnitude 3.2 but Sheliak varies between magnitude 3.4 and 4.4 with a period of 12.9 days. Sheliak consists of two stars in close orbit with each other. They are so close the two distort the atmospheres of each other making the light curves of the stars unique. This type of eclipsing variable star is known as beta lyrae type variables the name coming from this star. The famous Ring Nebula M27, NGC 6779 is found between Sulafat and Sheliak.

Bill Shackelford
Each night our view depends upon our eye