

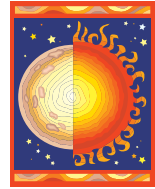


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Penobscot Valley Star Gazers

An Astronomical Society of Central Maine

Oh month of burning suns and mellow moons,
Which warm the heart as would some rare old wine!
-Eliot Ryder, of July



July 2023

July Meeting

The next meeting of the PVSG will be held by Zoom on Monday July 10th at 6:30 pm. (Zoom meeting ID 862 9984 6478 Password: PVSG.) We know naught about a program at this time.

Thanks for last month's program go to Shawn for allowing us to meet at the planetarium and to graduate student Nikita Saini for presenting the show *Cosmic Mashup* in Shawn's absence.



PVSG Monthly Meeting Minutes

June 12, 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 at the Versant Power Astronomy Center and by Zoom videoconference. The meeting was brought to order by Don Ferrell at approximately 6:40 PM.

Attendance:

In Person:

Don Ferrell – President
Don Krause
Wade and Donna Smith
Ralph Mallett
Phil Normand – Secretary

Online:

Dave Clark – Treasurer
Bill Shackelford
Dwight Lanpher
Shawn Laatsch

Presenter:

Nikita Saini

Presentation

Shawn spoke about being chosen, along with Nikita to be the Northeast Regional Coordinators for the Citizen Science Project called the CATE (Continental American Telescopic Eclipse) project. This project will setup 40 telescopes in the path of totality from Texas to Maine to collect polarity data on the Sun's Corona during the April 8, 2024 total eclipse. Nikita, a graduate student who works with Shawn, will act as trainer for the groups they recruit in the Northeast Region. Shawn is also working with the town of Jackman for observing the eclipse.

Shawn also mentioned Stars over Katahdin on October 14th and with the annular eclipse being on the same day, there will be solar viewing during the day.

The presentation in the dome was titled: *Cosmic Mashups* and discussed black holes. Nikita then showed a picture of galaxies interacting and preparing to merge. She then showed a recently taken image of numerous galaxies taken by the James Webb telescope. Lastly, Nikita discussed the Australian trip to see the total eclipse and displayed an image they took showing the Sun's Corona. Nikita displayed a postcard of the path of totality through Maine for the upcoming 2024 eclipse. Several members purchased cards on their way out of the facility. The location where Nikita and Shawn trained for the CATE project was Exmouth, Western Australia, Australia.

Secretary's Report and Acceptance of Minutes

The minutes for the May meeting were accepted unanimously.

Treasurer's Report

Dave stated that \$485.97 remains in the treasury. Dave has dues from an existing member and a new member were deposited. The treasurer's report was unanimously accepted.

Club Liaison Report:

No report this meeting.

Observing Reports:

Dwight took an image of M101 with the supernova in it with his Stellina telescope. He also showed his new solar telescope. It is a Lunt 152mm, solar scope. Dwight had to replace a broken Energy Reduction Filter. Many surface features as well as prominences were observable.

Old Business

The group discussed elections. The elections were supposed to be held in May with the new officers taking over in June. There were no new volunteers for President & Vice-President. Andy Brown does not want to run for Vice-President

again. Phil asked if we could get monthly volunteers to run the meetings instead of having a President & Vice-President responsible for doing that. Dwight and Dave pointed out that it would take amending the bylaws and approval from 50% of the membership.

New Business

Dave stated it was time to pay our Astronomy League dues. Dave will write a check for \$5.00 per member excluding Dwight. Members voted unanimously to pay the dues. Dave also shared an image from APOD showing thousands of galaxies and only three visible stars. The picture was taken by the James Webb telescope.

Upcoming Calendar of Events

Dwight mentioned solar observing at the Margretta Days at the University of Maine this coming Saturday. On July 29th, in Milbridge for Milbridge Days there will be solar observing as well. Phil mentioned a star party at the Night Owl Observatory at CMAS member Lenny Arsenault's house for this coming Saturday.

Adjournment

The meeting was adjourned at approximately 8:15 PM

Phil

planets Venus and Mars, with the star Regulus will fit in a circle with the diameter of 4.65° .

Planets this month – Full Moon was on Monday the 3rd, last quarter was on Sunday the 9th before the PVSG meeting on the 10th. The new Moon (Lunation 1244) will be on Monday the 17th and first quarter Moon will be on Tuesday the 25th. Mercury starts the month in superior conjunction with the Sun and slowly returns to the evening sky. It passes only 0.2° from the center of the Bee Hive cluster on the 15th. Mercury is mag. -0.7 on this date and 15° from the Sun. It passes 0.1° from the star Regulus on the 28th – 29th. Venus continues to be brilliant in the evening twilight sky. It passed its descending node on the 4th to begin a path to take it far south of the Sun when it reaches inferior conjunction next month. The waxing crescent Moon passes 8° south of Venus on the 20th and Venus begins retrograde motion on the same date. Through a telescope Venus grows in size from a crescent 33' wide to one 53' wide during the month as it comes closer to the Earth. Mars begins the month appearing only 3.6° from Venus and gets no closer. It then gradually pulls away from Venus as Venus falls back in the sky toward the Sun. Shinning at mag. +1.7 Mars has a close conjunction only 0.7° from mag. +1.4 Regulus on the 9th – 10th. The waxing crescent Moon passes near on the evenings of the 20th – 21st. Jupiter appears in Aries at mag. -2.3 and rises close to midnight. The waning fat crescent Moon passes by on the 11th. Saturn appears in retrograde in Aquarius. It rises close to midnight as it approaches prime viewing season. Uranus (Οὐρανός) appears in Aries in the morning sky. Neptune appears in Pisces and begins retrograde this month. 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 horizon and a 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. 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



Observe The Sky This Month Some Selected Objects July 2023

General sky comments – July 4 marked the day 247 years ago the United States declared itself independent from Great Britain. I trust everyone had a pleasant day. Went

to the beach, had a backyard cook out, watched fireworks, etc. Why do so many call the Independence Day holiday only July 4th when it is a celebration of the independence of the United States from Great Britain and should be called Independence Day? The Earth was at aphelion this year on July 6 at 152,093,251 km farthest from the Sun. If the Earth is farthest from the Sun in July why is it hottest this time of year rather than the winter when the Sun is closest to the Earth? The 23.5° tilt of the Earth has a much larger effect on heating with the Sun facing the Northern Hemisphere in the summer months than the short distance has in the winter. The full Moon was on July 3rd and it obtained perigee on July 4th at 6pm EST 360,149 km from the Earth. This makes it the first of the three so-called Super Moons this year resulting in larger than average tides. 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 our meeting night July 10th the

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 (γ) 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 $1\frac{3}{4}^\circ$ ESE to find NGC 6558 and $\frac{3}{4}^\circ$ 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 $\frac{3}{4}^\circ$ 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 $2\frac{1}{2}^\circ$ NW to M69, NGC 6637, do not confuse this globular cluster with NGC 6652 1° SW. From M69 go $2\frac{1}{2}^\circ$ 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 4^{th} magnitude stars. If you are already at M55 go about 6° NE of it to a grouping of four 4^{th} 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 Sagit-

tarius 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. $\frac{1}{2}^\circ$ 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. $2\frac{1}{2}^\circ$ 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 6^{th} 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 $4\frac{1}{2}^\circ$ 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. $4\frac{1}{2}^\circ$ west of M24 or $4\frac{1}{2}^\circ$ 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, 9^{th} 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 EGG 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.

Bill Shackelford
Dark skies return the night that we have lost