

Penobscot Valley Star Gazers

An Astronomical Society of Central Maine

The brightest day that ever shown on earth,
The day that Liberty received her birth.
-William Emmons



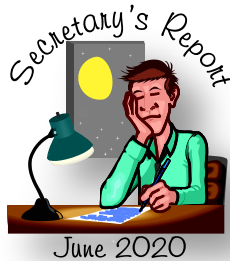
<http://www.gazers.org>

July 2020

July Meeting

Julius Caesar was born in 100 B.C. somewhere around the date of the July 2020 meeting of the PVSG, Monday the 13th. This will be another Zoom meeting and will start at 6:30 pm. As of press time we know naught about the details.

Thanks for last month's program go to Shawn Laatsch and Russ Glenn, Slooh Director of Education, for their talk about Slooh, the robotic telescope service and the new Emera Astronomy Center Slooh Group.



EAC on Slooh

PVSG Monthly Meeting Minutes
June 8, 2020
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.

verse Explorers of Maine. Presenters were Shawn Laatsch, Director of the Emera Astronomy Center and Russ Glenn, Slooh Director of Education.

On the Schedule

(Items Subject to Change)

PROGRAMS

STAR PARTIES

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

Meeting:

Call to Order and Welcome

The meeting was held by video-conference and called to order at approximately 6:30PM.

Attendance:

Dwight Lanpher – President
Scott Burgess - Vice-President
David Clark - Treasurer
Phil Normand – Secretary
Shawn Laatsch - Presenter
Russ Glenn - Presenter
Ralph Foss
Julie & Dale Brownie
Wade & Donna Smith
Bill Shackelford
Ralph Mallett
Don Krause
Don Ferrell
Andy Brown
Stom Ohno
Visitors:
Brian Murphy
Jon Silverman
Jill McDonald
Melissa Cushing
Hemendra Bhatnager
David Begin
Michael Marion

Summary: Shawn started the presentation by announcing the formation of the Universe Explorers of Maine online astronomy club in partnership with the International Planetarium Society and Slooh. Shawn then turned the presentation over to Russ who gave us an overview of Slooh. Slooh allows for:

- Personal astronomy through scheduling missions (observations made with one of the 8 current Slooh telescopes available to members).
- Group or communal astronomy where members can piggyback on already scheduled missions.
- Gamified Education through astronomy quests where members of all ages can follow a curriculum-driven process to earn exploration badges and gravity points while learning about astronomy and building an image collection.

Shawn then spoke more about the founding of the local online club and said that memberships to the club will help support the Emera Center. He pointed to the web page where anyone interested in joining could find the link and club code. (<https://astro.umaine.edu/universe-explorers-of-maine/>) Entry level membership is \$20.

Program

The program, a presentation of Slooh, an organization providing its members tools to explore space using telescopes on 3 continents, and information on a new online astronomy club, sponsored by the Emera Center called the Uni-

Announcement from Dwight

Dwight announced that Marc Stowbridge was planning a solar star party at Castle in the Clouds in New Hampshire in July with socially spaced scopes and wiping down eyepiece eye

cups with alcohol wipes. Dwight also mentioned that he has purchased a Vaonis Stallina observing station that is an 80mm telescope that does not have an eyepiece but rather broadcasts the images it takes through a wifi signal to up to 20 smartphones or tablets. The scope is fully automated and aligns itself. It takes 10 second exposures and stacks them to provide images. The scope is F5 and has a focal length of 400mm. The field of view is approximately 1 degree. Dwight thought this scope might be able to be used for a star party in Castine that the club had been approached to do.

Secretary's Report and Acceptance of Minutes

Phil stated that Julie & Dale Brownie had been inadvertently omitted from May's meeting minutes. Minutes were accepted unanimously.

Treasurer's Report

Dave Clark reported that the club had \$342.87 as of the end of May. Dave thanked Peter and Colleen Serrada for paying next year's dues already. David also asked the group for permission to pay our Astro League dues in the approximate amount of \$125.00. It was so moved, seconded, and unanimously approved. Dwight asked Dave to look into not having to pay for his dues as he is a member of the Astro League from several other clubs.

Observing Reports

Bill Shackelford, Jill McDonald, Shawn Laatsch and Wade Smith mentioned their observing and also photographs that they had taken over the last month.

Old Business discussion and election of Treasurer, Secretary and Member at Large

Dwight mentioned that we needed to hold a formal vote for Treasurer, Secretary and Member at Large. Phil noted that he and Dave had been nominated to remain in their current offices for two more years at the last meeting. Dwight asked for nominations for Member at Large. Phil nominated Andy Brown and it was seconded. The slate was unanimously elected.

New Business

- Dwight checked in with several members on how things were going under the COVID pandemic.
- CMAS invited folks through Andy Brown to join them by Discord to video chat and possibly share in their astro photography viewing on most Tuesday nights at 8PM.
- Dwight mentioned several meeting ideas that he is working on for future meetings, including holding large video conference

meetings with members from several Maine and New England clubs.

- The July meeting will also be held by video conference using ZOOM.

Adjournment

The meeting adjourned at approximately 8:30PM.

Phil

Observe The Sky This Month

Selected Objects

July 2020

General sky comments – This month is the heart of the summer viewing season. With so much to view and so little night time to view we need to get out as many times as possible. On any night you are unable to view it is a good time to catch up on our astronomy reading. A new book to check out is by the editor of Astronomy magazine, David Eicher, simply called "Galaxies". It is 250 pages long and divided into 5 chapters starting with an over view and proceeding to our galaxy, the local group of galaxies, our super cluster, and ending with the universe as a whole. With Eicher's writing style and the abundant diagrams, illustrations, and galaxy pictures you will understand the universe better than ever before. While reading "Galaxies" I have gained a fuller understanding of the known universe.

Planets this month – Full moon was on Sunday the 5th, last quarter was on Sunday the 12th, new moon will be on Monday the 20th, and first quarter is on Monday the 27th. Before the meeting in August the full moon will be on Monday the 3rd. Mercury was at inferior conjunction on the 1st of the month emerging in the morning sky during the month. It will be at greatest elongation West (GEW) on the 22nd at 20° from the Sun shining at mag +0.3. It brightens to mag -0.8 by the end of the month where it will be 17° from the Sun. Venus is prominent in the morning sky all month. It reaches greatest elongation (GIE) from the Sun on the 10th at a mag of -4.7. Look for Venus in or close to the Hyades star cluster. It is only 1° from Aldebaran on the 12th. Mars brightens from mag -0.5 to mag -1.0 this month. At month's end Mars rises around midnight and is in the sky for half of the night. The gibbous moon passes by Mars on the 11 – 12, 2° to the south. Jupiter is at opposition on the 14th at -2.8 mag and may be observed all night. It has a disk size of 47.6" and is located 22° south of the celestial equator. This is a good time to also observe the Galilean satellites as they are at maximum separation and brightness. Saturn is at opposition on the 20th at mag +0.1 with a disk of 18.5". The rings span nearly 43" and will also be visible all night. Uranus is in Aries where it may be viewed in morning twilight. Neptune is in Aquarius. Pluto is in eastern Sagittarius.

Constellations for the month – The constellation Corona Australis, the Southern Crown, at the Maine latitude just clears the horizon. It is an interesting object as it looks just like a crown a princess might wear. A circle of stars with an arc of brighter stars forming the front part of brighter jewels. Above is the constellation of Sagittarius, the Archer with its distinctive tea pot asterism. 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. (For more information and a viewer guide to Sagittarius read below in the featured constellation section). 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. Aquila is mostly noted for the bright star Altair (see below in the featured star section), 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 – Altair, Alpha (α) Aquila is the closest star of the Summer Triangle and at a distance of 17 light years has been directly imaged. Altair is one-and one-half times larger than our sun and ten times more luminous making it a so-called hot A-type star. Many double star catalogs list up to 6 companion stars but they are likely all background stars as they only move as the primary star moves. The most defining characteristic of Altair is its rapid rotation at one revolution every nine hours. Rotation speed can be measured by observing the Doppler shift of the spectrum absorption lines on both sides of the observed object. Because Altair is so close using the Mount Wilson interferometer this shift can be measured on both the leading and trailing limb allowing the determination of rotation speed. Rotation speed can be also measured by the amount the spectral gases are broadened known as Doppler broadening. Other methods include the timing of the transit of surface objects and measuring of the centrifugal distortion of the object causing portions of the surface to be cooler than others. All these methods have been used and Altair is 22 percent wider at the equator than the poles, tipped on edge from our point of view, has several bright and dark areas plus its rapid rotation. Vega in Lyra is also a rapid rotator at 12.5 hours.

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 star of which 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 100/25 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.

Featured constellation – Sagittarius is characterized by its abundance of globular clusters and unique deep sky objects. There are 20 easily observed globular seen 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. A few of the globular clusters I have observed start with the most southerly Sagittarius globular NGC 6723, located almost in Corona Australis. It is immediately above the top curve of Corona Australis and easily observable although you will need a low horizon. Others 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 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 nice. 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, then 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 M75, 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 $12^\circ+$ west of the handle of the “tea pot” to a grouping of four 4^{th} magni-

tude 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 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. $\frac{1}{2}^\circ$ 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 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 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 binoculars 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.

Bill Shackelford

Dark skies return the night that we have lost.