



Penobscot Valley Star Gazers

An Astronomical Society of Central Maine

<http://www.gazers.org>

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

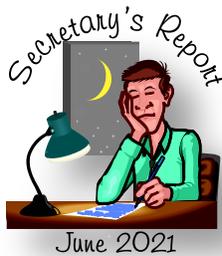


July 2021

PVSG at VPAC

The PVSG returns to the third dimension with the July 2021 meeting on Monday the 12th at 7:00 pm. It will be held in the Maynard F. Jordan Planetarium at the Versant Power Astronomy Center. Shawn reports that they have been authorized to resume full-capacity shows, although masks are still required inside the building. A Zoom connection will be available for those who need or choose to attend that way.

Thanks for last month's program go to Dave for his talk about finder scopes.



Finding Your Way

PVSG Monthly Meeting Minutes
June 14, 2021
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.

you find things or computerized goto telescopes, but Dave said that he is "old school" and makes use of star-hopping.

Older and very inexpensive telescopes may just have hollow tubes as a finder scope. Finding center can be difficult. Laser pointers or rifle sights could be used but they can be very bright and Dave stated that caution needs to be used so that one does not point a laser at eyes or at planes that might pass over an observing site. Laser reflex sights help you center your telescope by projecting a laser on a small glass pane. Gun type sights may be too bright. Astronomical use reflex sights like the Telrad usually can be dimmed and may not affect your night vision as much. Dave showed how some reflex sights use circles instead of a dot in the center making it easier to center that star in a circle rather than under a laser dot. Users may find they forget to turn off their red-dot finders and use up batteries.

Telescopes with focal ratios greater than F9 may have more than one finder scope. The Clark telescope at uMaine is an F13 and has 2 finder scopes to help zoom in on a target. Finder scopes may be straight through and are just mini refractors. They can be uncomfortable to use and viewed images are upside down and reversed. Dave then talked about right angle finder scopes that still reversed although now, right side up. The most popular and best finder scope would be the RACI or Right-Angle Correct Image finder. This type of finder and red-dot finders are the most popular today. Dave talked about Celestron's version that can rotate the diagonal and comes with an illuminated reticle.

At the end of the day, what is best is what works best for you. A 6X30 or 8X50 RACI finder may be your best bet. Try several out at star parties before you make your decision. Dave also showed a couple articles available on Agenaastro.com dealing with finder scopes for telescopes.

Dave opened it up for questions or comments. Shawn said he really likes his Telrad finder as the new ones allow for a lot more dimming, and he

Meeting:

Call to Order and Welcome to Visitors

The meeting was held by Zoom video-conference and called to order by Don Ferrell at approximately 6:35 PM.

Attendance:

Members:

Don Ferrell - President
Dwight Lanpher - Club Liaison
David Clark - Treasurer
Phil Normand - Secretary
Shawn Laatsch
Alan Davenport
Bill Shackelford
Ralph Foss
Ralph Mallett
Don Krause
Wade & Donna Smith

Programs and Astro Shorts

Program:

Dave gave a presentation on "Finding things in the night sky – going between your eye and the telescope".

Dave started by saying a good working knowledge of the constellations is required. Planispheres can be helpful, but need to be matched to your latitude and hemisphere. Dave talked about light pollution reducing your ability to see dimmer stars and deep sky objects. Dave briefly talked about apps that help

agreed with Dave that knowing the constellations is important. Shawn said he has even strapped a Telrad finder on the antique Clark telescope at the University. As an aside, Shawn said he and several others sent a letter to Dr. Nirav Shah asking for guidance on sharing eyepieces but has not yet received a reply.

Dwight shared his screen and agreed with Dave & Shawn in liking the Telrad. He showed a kit he bought from Germany that allows the laser image to flash slowly to make it easier to line up dim objects. The kit also includes an auto-shutoff feature to save batteries and has a dew shield. He sold that Telrad and now has a laser pointer mount on his scope.

Wade mentioned that one person with a laser can help a group with their observing. He urged caution in a group when viewing things that are low in the sky.

Review of the PVSG web site and the Night Sky Network web site by Phil Normand.

Phil gave a brief update of the PVSG web site and stated that the newsletters are up to date through June, 2021. Phil asked if we should include all active PVSG members to the NSN membership roster. This would let all members receive emails on virtual events directly from NSN.

Phil also showed the list of current locations on our NSN club page and our mailing address that was incorrect. Phil said he was happy to use his address as the physical mailing address. Shawn noticed that one of our addresses showed Emera instead of Versant Power. We also decided that we can add shows at the Versant Power Astronomy Center as community events on our events page. Phil also mentioned that the Googlegroups mailing list should be up to date.

Secretary's Report and Acceptance of Minutes

The May Meeting Minutes were unanimously accepted.

Treasurer's Report

Dave reported that for the month of May, our account had a total of \$539.37. The Treasurer's report was unanimously accepted.

Observing Reports:

Dave reported that he did not see the partial eclipse due to cloud cover but said **John Schuster** was able to observe it in Orono. **Dwight** showed a picture of the partial eclipse taken by a member of the New Hampshire Astronomical Society. **Shawn** said a picture was taken through the Clark telescope by graduate student, **Andrew Teller**. **Shawn** also said that **John Meader** took a sequence of pictures of

the partial eclipse. They can be seen on John's Facebook page.

Old Business

The group discussed filling the member at large position for a term of 1 year since Andy Brown is now the Vice-President. Dwight volunteered to combine this position with his club liaison position for a year and the group was in favor.

New Business

Don asked about our dues to the Astronomical League which is \$10.00 plus \$5.00 per member per year. Our cost would be \$155.00. Shawn noted that membership gives our club liability insurance. Dwight stated that Dave could remove his name since he is part of 3 other clubs that send dues to the Astronomical League. The group voted to pay the dues.

A discussion on having a meeting at the Versant Power Astronomy Center took place. Shawn invited the group to have a meeting there and stated that they are now open at full capacity. Masks would need to be worn inside the building. Dave asked if a zoom link would be made available. Shawn said that could be done but the online experience would be different. The group decided that we would meet on July 12th at the Maynard Jordan Planetarium at 7PM.

Shawn also said that he will be hosting the annual conference for the Middle Atlantic Planetarium Society (MAPS) in May 18-21, 2022. There may be an opportunity to set up some telescopes if we have a clear night and use the Clark telescope.

Dwight gave a Club Liaison Report. He showed a slide of a new Astro-imaging scope obtained by Southern Maine Astronomers. Dwight also reported that ASNNE had a star party a couple weekends ago at their Starfield observing location. He showed images he took with his Stellina scope.

Bill Shackelford showed an image of a partial eclipse he took years ago in Acadia National Park at dawn.

Adjournment

The meeting adjourned shortly after 7:45 PM.

Phil



Observe The Sky This Month Some Selected Objects July 2021

General sky comments – The Sun has advanced as far North in the Northern Hemisphere as possible and has begun its retreat south. This northern point was reached on the 27th of last month almost a week after the summer solstice. Why is there a discrepancy in the two dates? This is due to the tilt of Earth's spin axis to the axis of its orbit, and to Earth's varying speed along its elliptical orbit (as described by Kepler in his second law). Consequently summer days are much longer than winter days. (Much hotter too.) On May 10, 1994 there was an annular eclipse of the Sun. The center line of this annular solar eclipse passed over southern Maine with the center line passing through Seawall and very close to all of Mount Desert Island. I observed it at Seawall and was the only person I could see that did. Recently I came across a snapshot I took through a piece of non-optical grade aluminized plastic. It is not sharp at all but I can prove I observed this annular eclipse. Mostly I was impressed with the numerous Sun circles projected on the ground through the leaves on the few trees at my observing site. This eclipse did prompt me to purchase proper solar filters for my telescope.

Planets this month – Last quarter is on Thursday the 1st, new moon (lunation 1219) will be on Friday the 9th, first quarter will be on Saturday the 17th, full moon will be on Friday the 23rd, and the second last quarter of the month will be on Saturday the 31st. Mercury is at greatest elongation West (GEW) on the 4th at 22° from the Sun shining at mag +0.4. It brightens to mag 0.0 when the Moon passes 4° to the north on the 8th and mag. -1.0 on the 18th when it is still 15° away from the Sun. Soon it is lost in the morning twilight as it approaches superior conjunction on August 1st. Venus unlike last month is more difficult to observe. It gains some elongation from the Sun going from 25° to 33° but loses much more in declination making it difficult to observe for Northern Hemisphere observers. Venus on the 13th is only 0.5° from Mars but is difficult to observe as Venus is 200 times brighter. The waxing crescent Moon passes 3° north of Mars and Venus on the 11th – 12th. At a magnitude of +1.8 Mars is near its minimum. It is increasingly difficult to observe as it heads toward its conjunction with the Sun in October. Jupiter is in Aquarius retrograding westward. The waning gibbous Moon passes 4° to the south on the 25th-26th. Saturn is in Capricornus rising soon after twilight. The full Moon passes 4° south on the 24th. Uranus is in Aries where it may be viewed in morning twilight. Neptune is in Aquarius. Pluto is in eastern Sagittarius.

(The following observations may be more than you want to observe in one month. They are all available and in excellent position to view for the next few months. Take your time and enjoy the view.)

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 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. 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 that bowl all ready to dip into the sugar bowl of the constellation of Capricornus to the East. We will observe Capricornus later. 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 (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 1¼° 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 Aus-

tralis (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 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 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. 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. 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 (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 it has several bright and dark areas plus its bulge caused by rapid rotation can be directly observed. 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 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 Philippe 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 – Aquila, the Eagle. In Greek mythology, Aquila (Greek Οἰωνός) was sent by Zeus to abduct the beautiful Phrygian (Trojan) boy Ganymede to be his cupbearer and companion (probable Catamite). (Let it be known Zeus was not a virtuous individual.) The name Aquila comes from the word al-Nasr al-Ta’ir meaning “Eagle Flying”. Bedouin desert nomads have two classifications for the constellations. One is for large figures in the sky and the other for stars representing animals. There were goats in Auriga, camels in Draco, Lepus, The Hyades, and gazelles in Ursa Major using modern constellation names. Vega and Altair were the two Eagles or sometimes vultures. Both Babylonians and Sumerians called Altair the eagle and the two companion stars Alshain (β) and Tarazed the wings. Hindus did not consider these stars as birds but rather the footprints of Vishnu preserving the world from Shiva, the destroyer of the world.

Bill Shackelford

Dark skies return the night that we have lost