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# Penobscot Valley Star Gazers

An Astronomical Society of Central Maine

We've had some pleasant rambles,  
And merry Christmas gambols,  
And roses with our brambles,  
Adieu, old year, adieu!  
- George Lunt

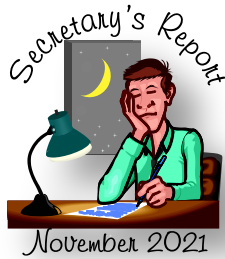


December 2021

## December 2021

The PVSG will meet remotely via Zoom on Monday, December 13, 2021 at 6:30 pm (Meeting ID 862 9984 6478 Password: PVSG). Doors will open around 6:15 for some socializing before the meeting. As far as we know, our speaker will be Scott Burgess.

Thanks for last month's program go to Larry Berz of the Francis F. Malcolm Science Center and Connor St. Peter, who discussed the realization of Conner's Eagle Scout project, the new observatory in Easton, ME.



### An Easton Observatory PVSG Monthly Meeting Minutes November 8, 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.

#### Meeting:

##### Call to Order and Welcome to Visitors

The meeting was held by Zoom videoconference. The presentation was introduced by Alan Davenport at approximately 6:35 PM. The business meeting was brought to order by Don Ferrell at approximately 7:30 PM.

#### Attendance:

##### Members Online:

**Don Ferrell - President**  
**Andy Brown - Vice-President**  
**Dwight Lanpher - Club Liaison & Member-At-Large**  
**David Clark - Treasurer**  
**Phil Normand - Secretary**  
**Bill Shackelford**  
**Scott Burgess**  
**Mary-Frances Beesorchard**  
**Ralph Mallett**  
**Wade and Donna Smith**  
**Ralph Foss**  
**Alan Davenport**  
**John Schuster**  
**Don Krause**  
**Shawn Laatsch**

##### Presenters:

**Larry Berz**  
**Roger Libby**  
**Conner St. Peters**

##### Guests:

**Justin Pelletier**  
**Evyn Lally**

#### Presentation

Larry Berz is the planetarium director for the Francis Malcolm Science Center in Easton, Maine. Conner St. Peter coordinated the building of an observatory at the Science Center as his Eagle Scout project this past summer. Roger Libby added his expertise to the design and building of the observatory.

The Francis Malcolm Science center began in 1983 to provide esteem based skills to school age children. Larry trained at the Adler Planetarium in Chicago prior to coming to Maine. Conner's project was originally planned for construction at the MSSM school location but was moved to the Francis Malcolm Center due to COVID regulations and financial constraints.

Conner shared pictures of the build and spoke of all the people who gave weeks of their time to help build the observatory. The dirt work and electrical began in the Spring and the build continued through the summer. After 6+ weeks the project was essentially complete. The telescope is a 20 inch f5 dob that was donated to the center in 2011. Roger upgraded the scope and the long term goal will be to add electronic servocat tracking. They also want to add an astronomy camera as an eyepiece and display images to wall mounted monitors.

#### Secretary's Report and Acceptance of Minutes

The October Meeting Minutes were unanimously accepted.

#### Treasurer's Report

Dave was having internet connection problems. Don reported our last month's total of \$541.37. Dues are now due and checks should be sent to Dave Clark 609 Cape Jellison Road Stockton Springs 04981.

#### Observing Reports:

**Alan** said he had not been able to see any of the Auroras that were supposed to be visible.

Don said he was able to observe Jupiter and Saturn the previous night. **Shawn** did an observing event up at Grand Lakes with about 30 participants. **Wade** saw a long trailed shooting star. Wade also got a new cell phone holder and has been taking pictures with less star elongations. He will show pictures at a future meeting. **Bill** mentioned that the Southern Orionids were currently being seen and often produce long fireballs. **Alan** mentioned he visited the Maine Mineral and Gem museum in Bethel and saw their extensive meteorite display. **Alan** shared several pictures from the museum.

#### Old Business

Don said he was contacted by Kristen Hibbard from the Challenger Center and that she has tasked Sarah Raymond with getting the Meade LX-200 from Don. Don also mentioned that anyone wanting to go through the astronomy books that were donated could contact him.

#### New Business

Scott said that John Bapst was opening to groups again and that we might be able to meet there again possibly as soon as next month. Scott will give a presentation next month.

#### Adjournment

The meeting was adjourned at approximately 8:20 PM

Phil



## Observe The Sky This Month Some Selected Objects December 2021

**General sky comments** – The winter solstice is on Monday December the 21<sup>st</sup> at 5:02 am EST. The Geminids meteor shower peaks in the late evening of Sunday the 13<sup>th</sup>. Observe them then, but better yet in the late morning of the 14<sup>th</sup>. The Moon will be a problem other times as it is past first quarter and nearing full moon. A few of the brighter meteors may be visible other times. The rapidly moving comet Leonard is making its way through the solar system never to be heard from again. It may become naked eye visible in the morning sky passing through Ophiuchus. If you don't like the way many pronounce the planet Uranus pronounce it like the ancient Greeks pronounced the god of the sky ΟΥΡΑΝΟΣ (oó – trilled r – a – noś).

**Planets this month** – New Moon is on Saturday the 4<sup>th</sup>, first quarter is Friday the 10<sup>th</sup>, full moon is on Saturday the 18<sup>th</sup> and last quarter is on Sunday the 26<sup>th</sup>. Mercury is too close to the sun to observe until it emerges close to Venus around the 25<sup>th</sup>. During the

last week of the year both planets will fit in a standard binocular field. Venus remains in the evening sky and achieved greatest illumination on the 3<sup>rd</sup>. The waxing Moon passes close on the evening of the 6<sup>th</sup> and then Venus rapidly dives toward inferior conjunction with the sun next year. Mars begins the month emerging in the morning twilight in the constellation of Libra. It moves into Scorpio mid-month and then into Ophiuchus late in the month. Jupiter is low in the SW sky. The waxing crescent Moon passes 4° to the south on the 8<sup>th</sup> and 9<sup>th</sup>. Saturn is also low in the SW becoming more elusive in evening twilight. The planet Uranus (ΟΥΡΑΝΟΣ in classic Greek) is in the evening sky in Aries. Neptune is in the SW evening sky in Aquarius. Pluto is too close to the sun to observe.

**Constellations for the month** – Once again starting at the southern reaches of the Maine sky we begin with the constellation Caelum, the Engraving Tool. This constellation lies at the same latitude as Canis Major which we will note next month. If you live at a location where the Big Dog is visible you may be able to observe some members of this constellation. Caelum may be the most obscure constellation in the sky. It is one of the 14 constellations created by Nicholas-Louis de Lacaille for his planisphere of the southern stars, published in 1756. The alpha (α) star Caeli is magnitude 4.5. Above is the next constellation Eridanus, the River, the longest constellation in the sky. Eridanus is so long it starts with its beta (β) star Cursa only 5° south of the celestial equator and winds through the sky as a path of stars ending with its alpha (α) star Achernar at -63° S. Cursa is 3° NNW above Rigel, (β) Orion and offers a contrast between beta stars of different constellations. Achernar is well below our horizon. Above the first straightaway of Eridanus is the constellation of Taurus, the Bull with the open cluster Hyades. Don't miss the open clusters NGC 1647 and NGC 1746 between the horns of Taurus. NGC 1746 is one of my most favorite open clusters because it is actually 3 open clusters in one and somewhat of a challenge. I first noticed it with a large binocular (25 x 100). Start with your lowest power to view NGC 1746 and then try to pick out the small concentrations of stars listed as NGC 1750 and NGC 1758 within NGC 1746. NGC 1746 is the grouping of around 20 bright stars. NGC 1750 is the concentration of dimmer stars within NGC 1746. NGC 1758 is the grouping of even dimmer stars partly outside of NGC 1758. Some observers call the whole cluster of stars NGC 1746. Observe this grouping and see if you think it should be one large cluster of stars from very bright to very dim or separate open clusters. The total of all the stars in the three groups is in excess of 75 stars. Included in Taurus is probably the most famous open cluster in the sky M45 aka Pleiades. Also in Taurus is M1 the "Crab Nebula." It is found 1° NE of zeta (ζ) Tauri. Perseus, the Hero, is above Taurus (see below). Above Perseus is the dim constellation Camelopardalis, the Giraffe, with its brightest star only at mag. 4.5. This is the beta (β) star. The most interesting Camelopardalis view is the asterism "Kemble's Cascade" a string of 8<sup>th</sup> mag. stars starting

with open cluster NGC 1502 forming an equilateral triangle with beta ( $\beta$ ) and alpha ( $\alpha$ ) Camelopardalis then proceeding to the NW. Get out a binocular for this one. While in this area of the northern sky note Polaris and how Ursa Minor, the Little Bear hangs down toward the North horizon at this time of year.

**Featured star** – Algol, beta ( $\beta$ ) Perseus is the most famous eclipsing variable star in the sky. It consists of a primary star and a secondary star in a close orbit only 6 million miles apart. The primary is a white star 100 times brighter than our sun and the secondary is only two or three times as bright as our sun. Because they are eclipsing stars their period and time of eclipse can be measured and predicted very accurately. The eclipse is 10 hours long (5 hours in and 5 hours out) and can sometimes be completely observed in one night. It has a period of 2 days, 20 hours, 48 minutes, and 56 seconds. There is a slight secondary dip in brightness midway through the period phase when the primary star eclipses the secondary but it is only evident photo electrically. The two stars shine at a combined magnitude of 2.1 most of the time but dip to 3.4 during the eclipse phase. There is also a third and possibly fourth star in the system but they are far enough away from the other members to not participate in the eclipse.

**Featured Messier object** – M76, The Little Dumbbell was discovered by Pierre Mechain in September of 1780 and then six weeks later re-discovered by Messier. It's usually called the "Little Dumbbell or Barbell Nebula" because of its resemblance to the larger Dumbbell Nebula (M27) in Vulpecula. William Herschel gave it two numbers then Dreyer changed the Herschel

numbers to NGC 650 and 651. In small telescopes M76 looks like a small oblong object and using averted vision it can be seen to have two distinct lobes. In larger scopes more detail can be seen. The following is my perception using my 12" telescope. "A pretty blue planetary. It is elongated with a bar on each side. One end is brighter than the other and slightly angled to the other bar." M76 in even larger telescopes can be seen to have an outer shell. The interior shows two distinct lobes connected by a less bright bridge.

**Featured constellation** – Perseus, the Hero. Last month it was mentioned Perseus saved the maiden Andromeda by turning Cetus, the Sea Monster to stone with the Gorgon Medusa's head covered with serpents. Perseus was able to cut off Medusa's head by looking at her head in his brass shield and not being turned to stone himself. Perseus the constellation is in the winter Milky Way and thus contains numerous open clusters, diffuse nebula, and surprisingly numerous galaxies. It also contains two Messier objects, the open cluster M34 and the planetary nebula M76. M34 is located 5° ENE of the variable star Algol, beta ( $\beta$ ) Persei. M76 the little dumbbell (see above) is located 1° above phi ( $\phi$ ) Persei.

**Other objects of interest** – Also located in Perseus is the famous double cluster of NGC 869 and NGC 884. Known to ancient Greeks and Babylonians as the scimitar Perseus used to decapitate the Gorgon, Medusa. For some reason Messier did not include the Double Cluster in his catalog.

Stars should be seen without a light in view

Bill Shackelford

## NASA Night Sky Notes



### Measure the Night Sky

By David Prosper

Fall and winter months bring longer nights, and with these earlier evenings, even the youngest astronomers can get stargazing. One of the handiest things you can teach a new astronomer is how to measure the sky – and if you haven't yet learned yourself, it's easier than you think!

Astronomers measure the sky using degrees, minutes, and seconds as units. These may sound more like terms for measuring time - and that's a good catch! – but today we are focused on measuring **angular distance**. **Degrees** are largest, and are each made up of 60 **minutes**, and each minute is made up of 60

**seconds**. To start, go outside and imagine yourself in the center of a massive sphere, with yourself at the center, extending out to the stars: appropriately enough, this is called the **celestial sphere**. A circle contains 360 degrees, so if you have a good view of the horizon all around you, you can slowly spin around exactly once to see what 360 degrees looks like, since you are in effect drawing a circle from inside out, with yourself at the center! Now break up that circle into quarters, starting from due North; each quarter measures 90 degrees, equal to the distance between each cardinal direction! It measures 90 degrees between due North and due East, and a full 180 degrees along the horizon between due North and due South. Now, switch from a horizontal circle to a vertical one, extending above and below your head. Look straight above your head: this point is called the **zenith**, the highest point in the sky. Now look down toward the horizon; it measures 90 degrees from the zenith to the horizon. You now have some basic measurements for your sky.



Use a combination of your fingers held at arm's length, along with notable objects in the night sky, to make smaller measurements. A full Moon measures about half a degree in width - or 1/2 of your pinky finger, since each pinky measures 1 degree. The three stars of Orion's Belt create a line about 3 degrees long. The famed "Dig Dipper" asterism is a great reference for Northern Hemisphere observers, since it's circumpolar and visible all night for many. The Dipper's "Pointer Stars," Dubhe and Merak, have 5.5 degrees between them - roughly three middle fingers wide. The entire asterism stretches 25 degrees from Dubhe to Alkaid - roughly the space between your outstretched thumb and pinky. On the other end of the scale, can you split Mizar and Alcor? They are separated by 12 *arc minutes* - about 1/5 the width of your pinky.

Keep practicing to build advanced star-hopping skills. How far away is Polaris from the pointer stars of the Big Dipper? Between Spica and Arcturus? Missions like Gaia and Hipparcos

measure tiny differences in the angular distance between stars, at an extremely fine level. Precise measurement of the heavens is known as **astrometry**. Discover more about how we measure the universe, and the missions that do so, at [nasa.gov](https://www.nasa.gov). This article is distributed by the NASA Night Sky Network, a coalition of hundreds of astronomy clubs across the US dedicated to astronomy outreach. Visit [nightsky.jpl.nasa.gov](https://nightsky.jpl.nasa.gov) to find local clubs, events, stargazing info and more.

