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# Penobscot Valley Star Gazers

An Astronomical Society of Central Maine

**October 10**

1846: William Lassell discovers Triton.

1980: Very Large Array dedicated.

1983: Venera 15 orbits Venus.

2007: ISS Expedition 16 crew launched.



October 2022

## Back to Bapst

Looks like the October meeting of the PVSG will be held at John Bapst Memorial High School on Monday the 10<sup>th</sup> at 6:30 pm. The meeting will also be available on Zoom. (Meeting ID 862 9984 6478 Password: PVSG.)

Thanks for last month's program go to Shawn for inviting us to the planetarium and showing the program *Forward to the Moon*.

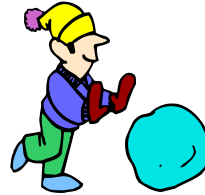


September 2022

### Trip to the Moon

PVSG Monthly Meeting Minutes  
September 12, 2022  
Planetarium and 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.



### Observe The Sky This Month

Some Selected Objects

October 2022

The recent opposition of Jupiter along with the not long ago Saturn opposition makes the two planets the object of night sky observations this month. They both can be observed on Moon-lit nights while deep sky objects are difficult to observe. Mars is moving toward its early December closest approach and opposition making it also an object of interest although surface features are not easily visible. Jupiter is the closest to Earth in 70 years and has numerous moon and shadow transits. All three planets are currently visible in the evening sky. The Orionid meteor shower will peak between October 21<sup>st</sup> and 22<sup>nd</sup> and will remain active until November 8<sup>th</sup>. The Moon this year will not be a problem as it is new on the 25<sup>th</sup>. The hourly zenith rate can be as much as 80 meteors per hour depending on conditions but expect a display rate of about 20. The Orionids are caused by the debris of comet Halley. Do not forget to observe the deep sky objects when the Moon is not visible.

#### Meeting:

My apologies. I am out of state and will not be home till late Sunday. I won't have time to get the meeting minutes to Ralph in time for the next newsletter.

-Phil

**The Moon and Planets this month** – Before the October meeting on the 10<sup>th</sup> the first quarter Moon was on Sunday the 2<sup>nd</sup>, full Moon was on Sunday the 9<sup>th</sup>, last quarter Moon is on Monday the 17<sup>th</sup> and the new Moon (lunation 1235) is on Tuesday the 25<sup>th</sup>. Mercury had the best morning appearance of the year away from the Sun in the northern Hemisphere. It reached the perihelion of its orbit on the 6<sup>th</sup> and its maximum western elongation on the 8<sup>th</sup> just 18° from the Sun shining at mag -0.5. Mercury continues to brighten but as it gets closer to the Sun and is harder to see until disappearing mid-month. Venus is too close to the Sun to observe this month. Mars continues to brighten from mag. -0.6 to -2.2 during October. It is in eastern Taurus. Jupiter is now prominent in the evening sky in Pisces. The almost full Moon passed 2° to its south on the 8<sup>th</sup>. Saturn is in the evening sky in Capricornus. The first quarter Moon passed 4° south on Oct. 4<sup>th</sup> – 5<sup>th</sup>. The planet Uranus (Οὐρανός) is in the constellation

Aries and at opposition next month on the 9<sup>th</sup>. Uranus will be occulted by the waning gibbous Moon in the overnight hours of the 11-12. The disappearance against the bright limb of the Moon will be more difficult to observe than the reappearance on the dark limb. Neptune is just past opposition and is in the sky in Aquarius. It is viewable most of the night. Pluto is in Sagittarius in the southwest sky.

**Constellations for the month** – To the east of Fomalhaut and Pisces Austrinus, the Southern Fish, we noted last month is the dim constellation Sculptor. This constellation was named by the French cleric and southern sky observer Lacaille around 1760. He originally called it “The Sculptors Workshop”. Later it was shortened to Sculptor. It contains a handful of stars magnitude 4 or less. However, Sculptor contains two objects of note a galaxy and a globular cluster. Star hop from Deneb Kaitos, Beta ( $\beta$ ) Ceti by using a sky atlas to find NGC 253 an object claimed by numerous people as the third most notable galaxy in our sky. (Note NGC 247 on the way by. You might think this is NGC 253 it is almost as good.) M31 the Andromeda Galaxy (NGC 224) and M33 (NGC 598) in Triangulum are better. NGC 253 (Caldwell 65), known as the Silver Coin or more properly the Sculptor Galaxy, was discovered by Caroline Herschel in 1789. It is the largest member of the Sculptor Group of Galaxies and truly spectacular. Do not miss this galaxy! You will be truly impressed. The other object NGC 288 is a globular cluster located 1.8° SSW of the Silver Coin Galaxy. It is class X thus contains less stars than most globular clusters. The South Galactic Pole is located less than one degree SSE of NGC 288. Above Sculptor is the western section of Cetus, the Sea Monster (Whale). (We will cover the eastern part of Cetus next month.) The brightest star in Cetus is mag 2.0 Deneb Kaitos, beta ( $\beta$ ) Ceti. (See below) Finding this star is easy as it is the brightest star in this part of the sky. 3° SSE of Deneb Kaitos is the galaxy NGC 247. I observed this galaxy before the Silver Coin. This galaxy is easily seen with any telescope and large binoculars. It is a large edge on spiral with a field star on one end. Also in this part of Cetus is a planetary nebula NGC 246. It was discovered by William Herschel on November 27, 1785. This planetary nebula is sometimes called the skull nebula because of the internal dark spots. To find it go 6.2° NNE of Deneb Kaitos. It makes a triangle with two 5<sup>th</sup> mag stars. NGC 246 is a bit faint but can be found with a 4” telescope. Above some 25° is an asterism known as the “Great Square” of Pegasus. It consists of a very distinctive square of stars one of which is in the constellation Andromeda, the Princess to be covered next month. This square of stars represents the wings of the great flying horse with the front portion we covered last month. Within this square of stars is a galaxy only 2½° WNW of the star at the SE corner of the square, the star Algenib, gamma ( $\gamma$ ) Pegasus. This galaxy is “The Little Sombrero Galaxy” (NGC 7814, Caldwell 43) a brighter galaxy than I expected to see when I first located it. In Greek myth Perseus was able to cut off the Head of Medusa, the

Gorgon monster whose look turned mortals into stone, by looking at her reflection in a shiny metal shield given to him by Athena. When the blood of Medusa fell onto the sand of the beach, out of the ocean foam appeared Pegasus. Perseus jumped on Pegasus and rode off to rescue Andromeda from her fate. From the previously observed Algenib go about 25° east to eta ( $\eta$ ) Pisces a 3<sup>rd</sup> mag star. Less than 1° ENE is M74. (See below) Pisces, the Fishes, will be covered next month, although it is spread through several constellations we have previously noted. Moving north we pass through the eastern portion of Andromeda to arrive at two northern constellations now very prominent in the overhead sky and in prime position for viewing. These are Cepheus, the King and Cassiopeia, the Queen. What I do not like is the high overhead placement of these constellations making them difficult to view with most telescopes. Of course you can just wait until later in the evening when these constellations have moved from such an overhead position. Best of all is to lie back on a lounge chair and use a binocular which allows you to observe the rich star fields of this region of the sky. Cepheus (see below) is not a bright constellation with the Alpha ( $\alpha$ ) star at magnitude 2.5 but the house shape or head with a pointed hat constellation can be found at moderately dark sites. Cassiopeia is easily recognized by most people from its “W” shape and its 2<sup>nd</sup> and 3<sup>rd</sup> mag stars. Both of these constellations have been extensively covered before and will be reviewed again next month.

**Featured star** – Deneb Kaitos, Beta ( $\beta$ ) Ceti is the brightest star in the constellation Cetus, the Sea Monster (Whale). It is almost one-half magnitude brighter than the alpha ( $\alpha$ ) star Menkar located on the opposite end of the constellation. Diphda is an alternate name for this star from the Arabic name meaning “second frog”. Arab astronomers originally called Fomalhaut “first Frog” before adopting the Greek name. Deneb Kaitos is a type KO bright giant similar to Arcturus but slightly hotter. This is not overly unusual except for the high X-ray emissions not normally found in a star of this type. X-ray emissions are generally considered to be produced by a rapidly rotating magnetic field heating an extended chromosphere. There is a problem. Deneb Kaitos is a slow rotator with a rotation period of about 115 days. The magnetism could have come from the time it was a main-sequence star with an unusual magnetic field. However, the chemical composition shows Deneb Kaitos is well into the helium burning phase, ascending the red giant phase of its evolution and not recently leaving the main-sequence. More study is needed.

**Featured Messier object** – M74 (NGC 628) is also known as the Phantom Galaxy. It is the most difficult Messier object for most amateur astronomers to observe. M74 was first observed by Pierre Méchain in 1780. He told Messier who added it to his catalog. Personally I find it slightly easier to observe than M101. Both galaxies have low surface brightness. M74 is smaller and fits in most telescope viewing fields while

M101 has a higher surface brightness it only fits completely in wide field views. Ease of viewing depends on what instrument you are using. Viewing conditions also come into play. Because of the low surface brightness any loss of visibility affects viewing. If you have trouble viewing try averted vision, have dark adapted eyes, or find another place or another day. Both of these galaxies are open face spiral galaxies making them popular for study. M74 has a history of numerous supernova.

**Featured constellation** – Cepheus, the King is one of the lesser known and not often observed constellations but it does contain many interesting objects starting with Herschel's Garnet Star discussed earlier. The beautiful double star Alfirk, beta ( $\beta$ ) Cepheus with the primary star a bright white and the blue secondary 13" apart. It is even more impressive in a larger telescope. Also found in Cepheus are numerous open clusters, nebula, one galaxy, and one planetary nebula that both need to be better known. The first is NGC 7160 an open cluster 4° due west of Alderamin alpha ( $\alpha$ ) Cepheus. NGC 7142 is also located 4° from Alderamin but NE and contains 3 times more stars than NGC 7160. NGC 7510 is an open cluster located 2° SW of M52 in Cassiopeia but in Cepheus. It is an interesting small cluster of about 20 brighter stars and numerous dimmer stars in an oval grouping which makes this cluster unique. While in this area look 2° west and slightly south of delta ( $\delta$ ) Cepheus the star at the bottom left of Cepheus to find NGC 7380 the Wizard Nebula. I saw about 20 stars scattered throughout the field of view with a hint of nebulosity. An O-III filter helps with observing this nebula. The cluster and nebula really come to life with long exposure photography and does resemble a man wearing a big pointed hat especially when the image is not overly processed. Now we will go to the other side of Cepheus to eta ( $\eta$ ) Cep the star 4° W of Alderamin. Two° SW is NGC 6939 an open cluster of about 75 to 100 stars in crossing lanes of stars in a "V" pattern on one side. Immediately SE is

the galaxy I mentioned at the top of this section. It is NGC 6946 the Fireworks Galaxy or ARP 29. At 135x with my 12" scope I could detect arms in this galaxy. I do not expect many observers will see much more than the central portion of this galaxy but if you get to see it through a large telescope it looks spectacular. It is known as the Fireworks Galaxy because in the last 100 years there have been 10 supernova observed in this galaxy compared to our galaxy with an average of one per century. The last supernova observed in NGC 6946 was in May of 2017. This was a type IIP supernova, a supergiant collapsed star. Finally NGC 40 is a planetary galaxy located 5½° SE of gamma ( $\gamma$ ) Cep. It is known as the "Bowtie Nebula" and has a bright central star at magnitude 11.5. In larger telescopes this planetary is quite spectacular with two bright ends. A 12<sup>th</sup> magnitude field star lies just outside to the SW.

**Other objects of interest** – In Cepheus is NGC 7142 a magnitude 9 open cluster located 4° NW of Alderamin. It contains upwards of 100 9<sup>th</sup> to 14<sup>th</sup> magnitude stars. You may have some difficulty finding this one as its stars tend to blend with the background stars. NGC 7789 was discovered by Caroline Lucretia Herschel in 1783 after being missed by Messier several years earlier. It is known as the Magnificent Cluster, the White Rose Cluster, and Caroline's Cluster. NGC 7789 is larger and has more stars than either M52 or M103. It contains upward of 300 stars and in my 12" telescope I could easily count at least 150 stars. To find this cluster go 3° SW of Caph, beta ( $\beta$ ) Cassiopeia. NGC 7662, the Blue Snowball is a planetary nebula. Its name describes it quite well. It is a blue-green color, not quite round, lighter in the middle, and the central star is visible at 14<sup>th</sup> Mag. in my 12" telescope. Find it in the far western side of Andromeda not far from the group of stars  $\psi$ ,  $\lambda$ ,  $\kappa$ ,  $\iota$ , 2½° WSW of  $\iota$ .

Bill Shackelford  
Come view with me and we will rule the skies