



# Penobscot Valley Star Gazers

An Astronomical Society of Central Maine

Ruffling the colors of the forest leaves,  
The winds make music as they come and go.  
-John Critchley Prince

<http://www.gazers.org>



October 2020

## Observations of the Red Planet

The next meeting of the PVSG will be on October 12, 2020 at 6:30 pm through Zoom (Meeting ID: 827 8883 5377 Passcode: 531592). Doors will open a little after 6:00 if you want to arrive early for some socializing. The main topic will be Mars, with members and guests sharing their observations and photographs.

Plans also include Dwight's follow-up astrobit about the Leviathan of Parsonstown.

Thanks for last month's program go to guest Ted Blank for his presentation on gravity waves and LIGO.



### LIGO

PVSG Monthly Meeting Minutes  
September 14, 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.

### Program

Ted Blank gave a presentation on LIGO and the detection and confirmation of gravitational waves.

Summary: Ted gave an overview of Gravity (Positive Force), Electromagnetic (Positive & Negative Force), The Strong Force (holds atomic nuclei together), and the Weak Force (mediates radioactive decay). Ted then discussed the construct of Space-Time. Space isn't empty or "nothing", but consists of the gravitational fields of all the objects in the universe. Experiments with viewing stars during an eclipse proved that light is bent by gravitational fields. Einstein predicted gravitational waves. Analysis of binary neutron star pairs gave indirect evidence of gravitational waves. On September 14, 2015, LIGO (Laser Interferometer Gravitational-wave Observatory) detectors from 2 locations in Washington State and Louisiana were used to detect a "chirp" from the merging of 2 black holes. Attempts had been made since the 1960's to detect gravitational waves. The LIGO installations have 2 4KM long vacuum chambers. Any vibration from traffic or other sources is detected by the observatories and can cause issues with the equipment. There are 5 current sites with a sixth planned. Space based observatories are planned for the future LISA (LIGO in Space), to be launched in 2034. 3 space based observatories will be able to detect gravitational waves from anywhere in the universe.

### Meeting:

#### Call to Order and Welcome

The meeting was held by Zoom video-conference and called to order by Dwight Lanpher at approximately 6:40PM.

Attendance:

**Dwight Lanpher – President**

**David Clark - Treasurer**

**Phil Normand – Secretary**

**Alan Davenport**

**Julie & Dale Brownie**

**Wade & Donna Smith**

**Bill Shackelford**

**Ralph Mallett**

**Don Krause**

**Don Ferrell**

**Shawn Laatsch**

#### Presenter:

**Ted Blank, joined from Fountain Hills, Arizona**

#### Visitors:

**Jon Silverman, President CMAS**

**Charlie Sawyer, Downeast Amateur Astronomers**

**Jill McDonald, Downeast Amateur Astronomers**

**Bob Costa, Downeast Amateur Astronomers**

**Peter Gillette, Vermont Astronomical Society, ASNNE**

**Hemendra Bhatnager, NH Astronomical Society**

**Sara Dinyari, ASNNE**

**Bernie Reim, ASNNE**

**Michael Marion, Acadia Astronomical Society**

### Discussion of the University Explorers of Maine

Shawn Laatsch spoke about the University of Maine group that uses Slooh to meet online on Friday evenings and use the telescopes available to Slooh members, located in Chile and the Canary Islands to make observations. A student Slooh account costs \$50 per year. If you join Slooh using the University Explorers group code, half the fee will go to the Emera Center. A discussion of Binocular Objects will

be held at the Friday, September 18<sup>th</sup> meeting at 8:30 PM.

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

Not discussed this month.

#### Treasurer's Report

No activity this month.

#### Observing Reports

Charlie Sawyer announced that although the Maine State Star Party was cancelled, Dwight, Charlie and another person got together using Dwight's Vaonis Stellina telescope. They will be getting together on October 10<sup>th</sup> in Pembroke, where they will also use laser pointers to point out naked eye objects.

Shawn also mentioned the Virtual Stars over Katahdin on October 15<sup>th</sup> at 6PM.

Jill McDonald got an 8 inch Meade SCT telescope from Charlie Sawyer and is learning to operate it. She observed the planet Uranus. Michael Marion said that Stars over Sand Beach has been going on this summer.

Bill Shackelford said it has been cloudy and smokey in Oklahoma.

Sara Dinyari from ASNNE said that star parties and Star Fest have been cancelled.

Wade Smith has been looking at Jupiter & Saturn.

Don Ferrell has been looking at Jupiter & Saturn & the moon with his dobsonian and attending the University of Maine Explorers meetings on Fridays.

Alan Davenport mentioned that he has an old 16 inch optical tube and mirrors that is free to anyone who will take all the pieces. He said it is old and heavy.

#### Old Business

None

#### New Business

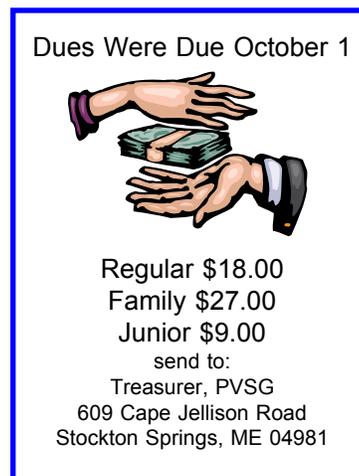
- Dwight thanked Phil and Ralph for the monthly newsletter. He also thanked Scott Burgess for running last month's meeting.
- Dwight thanked Dave Clark for keeping us apprised of Night Sky Network happenings.
- Dwight also thanked Bill Shackelford for his "What's Up" column each month.
- Dues are due and members can mail in their dues to Dave using the address on the web site.

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

#### Adjournment

The meeting adjourned at approximately 8:45PM.

Phil



---

## Observe The Sky This Month

### Some Selected Objects

October 2020

**General sky comments** – This month Mars is the closest it will be to Earth until 2035. If you have not get out there and observe it, I am. You will be surprised by the amount of detail you can see with any telescope. In the past I have used an 8" telescope and was able to make remarkably detailed drawings. Mars had a size of 22.4" at the first of the month and for a few days around opposition on the 13<sup>th</sup> Mars will be 22.5" in diameter. Because of the nature of the orbit the closest Mars gets to Earth happened on the 6<sup>th</sup> with a diameter of 22.6". You should easily see the south polar cap and surface detail depending upon what part of the surface is facing you at the time. In the past I have seen Syrtis Major, a huge dark region, Sinus meridiani, a bright area with a dark streak down the middle, and even the clouds over Olympus Mons. This is only a portion of that possible to observe through a modest telescope. When observing be patient (Mars will be small even at 220x) the seeing comes and goes most nights. The longer you observe the more you will be able to see.

**Planets this month** – Before the October meeting on the 12<sup>th</sup> the full moon was on Thursday the 1<sup>st</sup>, last quarter moon was on Friday the 9<sup>th</sup>. New moon is on Friday the 23<sup>rd</sup> and the second full moon is on Saturday the 31<sup>st</sup>. Before the November meeting on the 9<sup>th</sup> the last quarter moon will be on Sunday the 8<sup>th</sup>. Mercury reached greatest eastern elongation from the sun on

Thursday the 1<sup>st</sup> at 28°. Venus remains high in the morning sky. The waning crescent moon passes by 4° north on the morning of the 13<sup>th</sup> and 14<sup>th</sup>. Mars starts out the month brighter than Jupiter and was closest to Earth on the 6<sup>th</sup>. It is at opposition on the 13<sup>th</sup>. Jupiter is low in the southwest evening sky in Sagittarius. It sets later in the evening. The waxing crescent Moon passes nearby on the 21<sup>st</sup> and 22<sup>nd</sup>. Saturn is low in the southwest in Sagittarius setting after Jupiter. The Moon passes 3° south on the evening of the 23<sup>rd</sup>. The planet Uranus (Οὐρανός) is in the constellation Aries and at opposition on the 23<sup>rd</sup>. Uranus can be seen as a 5.7 mag star with no optical aid at a dark site. With a telescope it has a 3.7" disk. 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 SW sky between Jupiter and Saturn.

**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. Use a sky atlas to find NGC 253, an object claimed by numerous people as the third most notable galaxy in our sky after M31 the Andromeda Galaxy (NGC 224) and M33 (NGC 598) in Triangulum. NGC 253, known as the Silver Coin 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° SSE 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 SSW 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 (β) 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 it 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, gam-

ma (γ) 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 (η) 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 previous 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 (α) 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 (β) Ceti is the brightest star in the constellation Cetus, the Sea Monster (Whale). It is almost one-half magnitude brighter than the alpha (α) 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. Another is 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 cross-

ing 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