



# Penobscot Valley Star Gazers

An Astronomical Society of Central Maine

<http://www.gazers.org>

Now Autumn's golden stores behold, with fruit each tree is crowned;  
Peaches in suits of red or gold, each twig bows toward the ground.

September 2019

## Back to Bapst

Jupiter will be at eastern quadrature when the PVSG meets at John Bapst Memorial High School at 6:30 pm on Monday, the 9<sup>th</sup> of September, 2019. The program may be Dwight's report on his first trip to Stellafane.

Thanks for last month's program go to Shawn for letting us meet at the planetarium and for presenting the show *Einstein's Gravity Playlist*.



### Wavy Gravity PVSG Monthly Meeting Minutes August 12, 2019

#### Part I: Program

- **Call to Order and Welcome**  
Meeting called to order at 7:04PM.  
Attendance:  
Scott Burgess – Vice-President  
Alan Davenport  
Ralph Foss  
Don Ferrell  
Don Krause  
Ralph Mallett  
Julie and Dale Brownie  
Phil Normand – Secretary  
Shawn Laatsch  
Wade & Donna Smith  
Visitors: none
- **Program (presented by Shawn Laatsch)**

#### **Einstein's gravity playlist.**

This presentation will be shown at the Emera Planetarium in November in conjunction with a talk on the 2<sup>nd</sup> Thursday in November by Dr. Emanuele Berti from LIGO.

The presentation was a 22 minute digital planetarium show exploring the ripples in space-time known as gravitational waves. Narrated by Lucia, a PhD student in physics. She explains how gravitational waves are formed, how they move through the Universe and how scientists work to hear them. Lucia explained how a century after Albert Einstein first predicted the existence of gravitational waves in 1916, scientists finally detected these waves using incredibly precise laser technology on Earth. In honor of this long-anticipated detection, the scientists who created the Laser Interferometer Gravitational-Wave Observatory (LIGO) received the Nobel Prize in Physics in 2017.

*Einstein's Gravity Playlist* was created through a collaboration between MSU's eXtreme Gravity Institute, the Department of Physics, the School of Film and Photography, and the School of Music. It premiered at the Museum of the Rockies' Taylor Planetarium in 2017.

- **Observing Reports**

**Phil:** Observed Jupiter, Saturn, and the moon.

**Wade & Donna:** Went to Stellafane and Wade said he was able to observe Jupiter through the 13 inch Schuppman telescope. On the next day he went to their solar observatory and observed a solar prominence. He could not see any sunspots. Saturday night on Breezy Hill, Wade observed through a 10 inch scope made by Norman Fullham. He let Wade observe while he played guitar. There was fairly good weather for the weekend, quite hot & humid. Saturday night observing was excellent. Back at home

### On the Schedule

(Items Subject to Change)

#### PROGRAMS

?September 9: Dwight's Stellafane report

#### STAR PARTIES

?Sometime this fall: Carver Library in Searsport star party

September 20 to 23: ASNNE Starfest (New Date!)

September 21: Stars Over Katahdin

September 25 to 29: Acadia Night Sky Festival

?October 26: Club star party at Ben Philips'

?November 2, 7, or 9: Challenger Center star party

?November 23: Bangor Land Trust

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

Wade and Donna looked at moon with 4" Mak. They also saw 4 meteors and the ISS pass overhead. Wade also mentioned that a person at Stellafane claimed to have a super excellent mirror with better than 1/10<sup>th</sup> wave and he said that it really shows on globulars.

**Scott:** Scott took home Ralph's 50<sup>th</sup> anniversary 2004 Questar with better than average optics. Guaranteed 1/10 wave. Scott couldn't see much difference, they were both phenomenal. 342X on moon still looked OK.

**Shawn:** Spoke of issues in Hawaii on Mauna Kea. One telescope is back in operation after 4 weeks down. There has been lots of down time due to protests.

## Part II: Business

- **Secretary's Report and Acceptance of Minutes**  
Last month's minutes were approved.
- **Treasurer's Report**  
Dave was absent but emailed the Treasurer's Report to Scott. The check to the Astronomical League was cashed. The balance as of 7/31 is \$253.07. Dave wanted to remind everyone that dues are coming up in October.
- **Old Business**  
Dwight got 250 pens. He will cover \$108.36 and be reimbursed \$100.00.

Calendar review: ASNE Star Fest in Kennebunk will be on September 20<sup>th</sup>-22<sup>nd</sup>. Shawn spoke about the July 20 Apollo celebration. About 100 people participated on a very hot day. George Nelson, a Maine grad, keynoted lunch that day. Randal Scott will speak in October on Chandra and Dr Bertie in November. On Friends and Family weekend in November, several shows will be presented in the planetarium. There are programs on Sunday of the ANSF weekend as well.

Phil discussed making bookmarks or brochures. Shawn said a trifold or rack card would be good for display at the Emera Center. Phil mentioned that our internet site and FaceBook site might need to be brought up to date if we will be pointing people to it.

Next Month's meeting will be at John Bapst on Monday, September 9<sup>th</sup> at 6:30PM.

- **New Business**  
Call for programs beyond next month. Wade will have something hopefully by November on his potato barrel telescope. Wade said he could also discuss a quicker way of silvering a mirror

that he saw done at Stellafane. Wade is waiting to hear from the Challenger learning center program for November 2<sup>nd</sup>, 7<sup>th</sup>, or 9<sup>th</sup>. Shawn said that he is also working with the Challenger Center for a Sept 25<sup>th</sup> launch party for Caribou native Jessica Mears is scheduled to make her 1<sup>st</sup> trip to ISS.

- **Adjournment**

The meeting was adjourned at 8:09.

Phil

Dues Are Due October 1



Regular \$18.00  
Family \$27.00  
Junior \$9.00

Pay at the meeting or send to:  
Dave Clark  
609 Cape Jellison Road  
Stockton Springs, ME 04981

## Observe the Sky This Month Some Selected Objects September 2019

**General sky comments** – This month the Milky Way is still very prominent in the early evening sky slowly turning to overhead throughout the night. I will be at the OkieTex Star Party during the week of new moon and am always fascinated by being able to see the Milky Way and it is light enough to see my star charts without a red light. We should all enjoy the many show pieces of the sky so well placed for observing at this time of the year.

**Planets this month** – Mercury will appear low in the evening sky late in the month after being in conjunction with the Sun on the 4<sup>th</sup>. Venus reappears in the western sky mid-month and will then be visible low in the SW. Mars is too close to the sun to be seen. Jupiter is prominent in the evening sky during the month in the constellation of Ophiuchus. Saturn is below and east of Jupiter in the constellation of Sagittarius. Uranus rises before midnight and will be opposite the Sun next month. Neptune is observable all night and in Aquarius. Pluto remains in Sagittarius at magnitude 14. First quarter moon is on Thursday the 5<sup>th</sup>, full moon is on Saturday the 14<sup>th</sup>, last quarter is on Saturday the 21<sup>st</sup>, and new moon is on Saturday the 28<sup>th</sup>.

**Constellations for the month** – Last month we ob-

served the last of the summer constellations and most of them remain visible and ready to be viewed if you have not done so. We will add a few more this month and take advantage of the excellent sky conditions and weather occurring this time of the year. This month when the sky becomes completely dark known as "Astronomical Twilight" the following constellations will be visible starting with the constellation most southern for us Piscis Austrinus, the Southern Fish. I usually think of this constellation as a fish with its mouth wide open and turned up to catch the water falling through the sky from the "Water Jar" of Aquarius the constellation above. Piscis Austrinus is very simple to find. Low in the sky about 10 to 15 degrees above the horizon you will see the 1<sup>st</sup> magnitude star Fomalhaut. It will not be as bright as you might expect due to the low latitude but it marks the bottom of the mouth of the fish. Dimmer stars form the body of the fish. If it was not for Fomalhaut and a few double stars, Piscis Austrinus would not be worth observing for us. The easy double star 4.3 and 7.1 magnitude Beta ( $\beta$ ) 6° WSW of Fomalhaut, Dunlop 241, a pair of orange stars 1° NW of Beta, and H VI 119 a triple system 1° slightly west of south of the top star of the "Fish" epsilon ( $\epsilon$ ) with a close pair of yellow stars and a more distant blue star. Above is the constellation Aquarius, the Water Bearer which will be covered extensively below in the featured constellation segment. Above the asterism in Aquarius known as the "Water Jug" we will pass through the western third of another fall constellation, Pegasus, the Winged Horse and discuss it next month before coming on an obscure constellation Lacerta, the Lizard. Lacerta is another small constellation invented by Johannes Hevelius to fill a hole not otherwise covered in the sky. It contains mostly 4<sup>th</sup> and 5<sup>th</sup> magnitude stars but is not particularly difficult to observe in a reasonably dark sky. The major features of Lacerta are three open clusters. NGC 7296 is located ½° east of Beta ( $\beta$ ) Lacerta the top star in the constellation. This will probably be the most difficult object you will observe this month. It is a collection of two to three dozen faint stars resolvable at 100X with a larger telescope. NGC 7243 is much easier to find 2½° SSW of Beta ( $\beta$ ). This cluster is a semi-circle of stars with a tight grouping of four or five stars at the bottom center and it stands out in the field of background stars. Continue another 3½° on SSW of NGC 7243 to find NGC 7209 an open cluster of 75 to 100+ stars depending on the size of your telescope at 100X. NGC 7209 is surrounded by several brighter stars not part of the cluster. Above Lacerta is Cepheus, the King. The constellation to me looks like a big head with a pointed nose and pointed hat but to others it resembles a house with a pointed roof. Cepheus was the husband of Cassiopeia and father of Andromeda. The mythology of this family we have covered before. The precession of the axis of the Earth brings the direction of the future North Pole through this constellation with Errai, gamma ( $\gamma$ ) the top star in Cepheus the pole star in 2,000 years and the alpha ( $\alpha$ ) star Alderamin the pole star in 4,700 years. The pole also passes near Alfirk, beta ( $\beta$ ) but not as close as the other two stars. Halfway between Alderamin and iota ( $\iota$ ) is the white and light yellow double

star Kurhah xi ( $\xi$ ). This double is a true pair. At the bottom left side of Cepheus is the star delta ( $\delta$ ) the original Cepheus variable star. 5½° ESE of Alderamin is one of the deepest red stars in the sky known as Herschel's "Garnet Star." This star looks the reddest in small telescopes and near minimum magnitude. This star is similar to Betelgeuse being a pulsating red supergiant but probably brighter considering the differences in distance of the two. NGC 7160 is an open cluster 4° W of Alderamin. It contains about a dozen stars with a couple of brighter stars one being double. 4° NE of Alderamin is the open cluster NGC 7142 a large loose collection of about 100 stars. 2½° E of delta ( $\delta$ ) is the open cluster and emission nebula NGC 7380. It contains near 30 stars embedded in an emission nebula visible without aid but a UHC filter brightens it considerably.

**Featured star of the month** – Zeta ( $\zeta$ ) Aquarius is a double star with sub-companions located slightly north of the celestial equator. Until November of 2003 it was located south of the celestial equator but because of precession it is now approaching 6 arcminutes north. We may think precession is extremely slow but it is faster than one might think. Zeta is the dimmer of the two stars at the tip of the asterism "The Water Jug". It is a well-known double star that is a test for any telescope. A 3 inch telescope under excellent conditions might be able to separate the two. It is a better test for larger telescopes. The two stars are magnitudes 4.3 and 4.5 combining to give a magnitude of 3.7. Being so close together and so close in magnitude make for an extremely difficult pair to separate. Another companion star had long been suspected in the zeta system but no astronomer could determine its position until speckle interferometry, adaptive optics, and high-resolution cameras resolved at least one other companion in the system. Several different teams published results but they did not completely agree. Currently it is not known for certain if the Zeta system contains three or four components.

**Messier object for the month** – M2 is the showcase object of Aquarius and should not be missed. It is a class II globular cluster almost as full of stars as is possible. If M2 were located at half the distance it might be brighter and larger than Omega Centauri and certainly a naked eye object. M2 was discovered in September 1746 by Giovanni Domenico Maraldi while observing Comet de Chéseaux with Jacques Cassini, son of Giovanni Cassini. They also discovered M15 while observing the same comet. On September 11, 1760, Messier recorded it as number 2 on his list. He wrote "Nebula without stars in the head of Aquarius. The center is brilliant, and the light that surrounds it is round; it resembles the beautiful nebula which is between the head and bow of Sagittarius (M22?)". I wrote "Big and bright with stars resolved well into the core. A couple of bright stars and a scattering of field stars on the right and bottom". As telescopes became more advanced the description became better until in 1830 John Herschel using a 9-inch telescope wrote "heap of fine sand". You will probably need at least an 8-inch telescope to resolve stars very far into the core. I used a 12-inch telescope.

**Featured Constellation** – Aquarius, the Water Bearer is a long constellation and covers a large segment of the sky one end of which protrudes into the summer constellations. Last month we mentioned two Messier objects M72 and M73 plus the planetary Saturn Nebula in the western third of Aquarius. Now we will cover the rest of the constellation. When I look at the total constellation of Aquarius I imagine a person holding a jug under their left arm with water pouring out of a jar of water, breaking into three streams one of which pours into the mouth of the southern fish and the other two pour into a river. The jug with the water pouring out is represented by a diamond of four stars, Sadalmelik alpha ( $\alpha$ ), Sadachbia gamma ( $\gamma$ ), zeta ( $\zeta$ ), and pi ( $\pi$ ) ranging in brightness from magnitudes 2.9 to 4.4. The water coming out of the jug is represented by the 4.0 magnitude star eta ( $\eta$ ). Arching down SW we come to a grouping of five stars where the water from the jug breaks up into streams. Three of the stars are close together and two are separated a bit. They are phi ( $\phi$ ), chi ( $\chi$ ), and 1, 2, 3 psi ( $\psi$ ). Less than  $1^\circ$  NNW of the middle psi (2) is the galaxy NGC 7606 a spiral easily seen at 136X with some detail using my 12" telescope. From 1, 2, 3 psi ( $\psi$ ) go  $6^\circ$  SW to a pair of galaxies,

NGC 7727 and NGC 7723. NGC 7727 is a barred spiral but I could only note the center had several parts. NGC 7723 is likely a disturbed spiral galaxy as I could detect an unusual looking center. The last object I have observed in Aquarius is the Helix Nebula NGC 7293. This planetary nebula should be observed by everyone. The following are my field notes: Large, brighter than expected. Numerous stars visible inside. What appears to be the central star was just visible at 13<sup>th</sup> mag. with averted vision at 150x. This was with a 12" telescope but smaller telescopes also give a nice view of this bright planetary nebula.

**Other objects for the month** – If you have a medium to large telescope look for NGC 40 (Caldwell 2) a round planetary nebula with a bright section on one side  $5\frac{1}{2}^\circ$  ESE of Errai, gamma ( $\gamma$ ) Cepheus. I found it by star hopping from Errai using a star chart. Some have said it almost looks like the planet Mars with its polar cap but without the red color. The central white dwarf star is visible at powers above 200x.

Bill Shackelford

Come view with me as we observe the sky