Penobscot Valley Star Gazers

An Astronomical Society of Central Maine

http://www.gazers.org

Cold blows the wind, the frozen rain and fleecy snow descend;
For, freezing winter's come again, and so the year does end.

December 2019

PVSG to Party at Kosta's

The December 2019 meeting of the PVSG will be held at Kosta's restaurant in Brewer on Monday the 9th at 6:30 pm. Dwight has promised to provide an interesting video plus other things (see below).

Thanks for last month's program go to Mother Nature.

No Meeting, No Minutes

The November 11, 2019 meeting of the PVSG was canceled due to a snowstorm.

Observe The Sky This Month

Some Selected Objects

December 2019

General sky comments – The winter solstice is on Saturday December the 21st at 11:19 pm EST. I plan to attend ALCORS 2020. Albuquerque is within one day drive of my house and if any club member would like to join me there next July I would be glad to split the cost of the lodging. Lodging is two room suites. My car would also be available therefore there would be no car rental needed.

Recently I read a profile of William Herschel and his family notably his sister Caroline and younger brother Alexander by Jeff Kanipe. There is not room here to state all I learned but I will convey interesting facts which might be of interest to all. William was born Friedrich Wilhelm Herschel on November 15, 1738 in Hanover, Germany the son of Isaac and Anna. Isaac was a bandsman in the Hanoverian Guard thus all his children had a musical upbringing although Anna thought more of Caroline as a household servant than a daughter. William was taught the violin as a young child using a small violin made especially for him. At 14 he joined his father's regiment as an oboist and learned musical theory. As a guardsman he was briefly sent to England as King George II was a Hanoverian and needed protection from a French invasion which never happened. While there he was able to practice his English. Soon his regiment was recalled to Germany where he was involved in the battle of Hastenbeck on July 26, 1757. After this battle his father advised him to look for his own safety and he soon moved to England with his brother Jacob (who later returned to Germany) where he was briefly considered a deserter. Since he joined the Hanover guard at 14 as a noncombatant bandsman the deserter charge was eventually dropped. In England his first permanent paid job was in 1766 as organist for Octagon Chapel in Bath. While at Bath he was a performer, teacher, concert director, and composer writing concertos, sonatas, organ pieces, and symphonies. In August of 1772 he brought his sister Caroline Lucretia who he called Lina to England where she joined her

On the Schedule

(Items Subject to Change)

PROGRAMS

December 9: Kostas

STAR PARTIES

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

Hello All,

This is a reminder of our special Christmas party meeting at Kostas Restaurant, Monday evening, December 9 at 6:30 pm. We will meet in the private dining room on the left as you enter.

For our astro short presentation, we'll review the Star Party held at Ben Philips in October. And I invite all those that wish, to share a short story or even a few sentences of a special astro-event, an interesting astronomy figure, a special meeting, star party, observation or some other special astro event.

We will also review the coming year's proposed event schedule, that will be handed out.

There will be a couple nice door prizes to be given away by drawing.

For the main presentation, I've found another entertaining researcher, Dr. Katie Boughman, describing the blackhole photo released in April. She will explain, via a video, the background behind how the image was created utilizing a team of scientists, some fancy math and a world radio telescope network

See you [Monday night] for good food, good company and good entertainment. ---Dwight

brother Alexander who had already joined William. As a child of 10 Caroline had smallpox and typhus. Smallpox left her pockmarked and typhus stunted her growth to four foot three inches. During this time in Bath William became more interested in Astronomy and observed both Venus and a solar eclipse. He also rented a small telescope. In the 1770's he began connecting the mathematics of music and astronomy. Slowly he became more interested in astronomy reading several popular astronomy books and discussing them with his brother Alexander. He began attempting to make his own telescopes with the help of his brother and on March 1, 1774 he turned his first successful telescope on the Orion Nebula and Saturn. That night he began his first observing journal. Telescope making began to take over the entire house much to the dismay of Caroline who finally gave up and even began helping by spoon feeding and reading to William while he was grinding mirrors. One of the first of his many telescope innovations was interchangeable speculum mirrors that easily tarnished and needed to be frequently changed. Thus he was able to keep observing instead of stopping to polish the mirror. During his time at Bath William gave 30 to 40 music lessons a week, composed, gave concerts, and in his leisure time casting, grinding, figuring mirrors, making telescopes, and observing. All this was carefully documented. Meanwhile the Herschel family moved at least three or four times and Caroline's music career had grown to where on April 15, 1778 she was the principal soloist at the final seasonal performance of Handel's Messiah in the concert room at Bath. She was offered a chance to begin her own musical career but declined because she later wrote in her biography, "I never intended to sing anywhere but where my brother was not the Conductor." She later blamed him for running her musical career but as we now know she became more famous as a comet, star cluster, and nebula discoverer and documentor of her brother's work than she would likely have become as a singer. On December 31 of 1779 William was invited to join the first meeting of the Bath Philosophical society by William Watson Jr. a member of the Royal Society of London. This began his career as a professional astronomer because he was now able to publish. On March 13, 1781 he observed a "star" that could be enlarged unlike a star. He first suspected it was a comet but soon it was recognized as the first planet discovered since ancient times now known as Uranus. William Herschel was elected a fellow of the Royal Society in November of 1781. He was given a royal stipend by George III (before the king had mental problems and was an excellent amateur astronomer). In July of 1782 William and Caroline moved to Datchet near Windsor (eventually moving to Windsor Road, Slough in 1785) and continued observing double stars but found his first nebula (the Saturn Nebula). William gave Caroline a small telescope and told her to find interesting things. "I found I was to be trained for an assistant Astronomer." About this time William received a copy of one of the first Messier catalogs and soon Caroline was finding objects not in the Messier catalog. Her first independent discovery was NGC 2360 (an open cluster in Canis Major). By the end of 1783 by her count she had found 14 new nebula by sweeping the sky and was considering her own catalog. On March 4, 1783 William took his sister's lead (for once) and broke off his double star work and began to sweep the sky for nebula and star clusters. On October 23, 1783 he had completed an 18.5 inch telescope with a steady mount and began using it to sweep the sky. In April 1784 he sent a list of 388 (soon corrected to 440) nebula not known by Messier to the Royal Society along with a list of Messier nebula actually star clusters. At the same time he noticed the Milky Way was composed of stars. While observing a planetary nebula (NGC 1514) he reversed his belief nebula were composed of stars seen at great distance to a belief some were surrounded with a faintly luminous atmosphere. William also discovered tenuous objects were best seen when eyes were dark-adapted and had Caroline write down observations shouted to her through an open window where she could see to write and use the clock. William Herschel over his lifetime observed and catalogued almost 2,500 objects forming what would become the core of the still used J.L.E. Dreyer's *New General Catalog*. Caroline discovered 8 comets 5 of them previously unknown. She rearranged the John Flamsteed star catalog to be more useful for observing. Caroline moved back to Hanover after the death of her brother in 1822, was awarded honorary membership in both the Royal Astronomical Societies of England and Ireland, and continued to edit and catalog his work until her death in 1848 at age 98. Alexander Herschel is not often recognized for his work but he was mechanical gifted like his brother William. He was a brass worker and made the bells, eyepieces, mirrors, micrometers and pendulum clocks used by his brother and sister.

Planets this month –The new moon is on Thursday the 26th, first quarter is on Wednesday the 4th, full moon is on Thursday the 12th and last quarter is on Wednesday the 18th. The Geminids meteor shower peaks in the morning of Friday the 14th. Unfortunately the moon will interfere because it only two days past full. Mercury is visible until late in the month in the morning sky. Venus is approaching earth and rising higher in the evening sky. Look for it early next year to show a great view in the Northern Hemisphere. Try to observe the Moon and Venus when they are within one degree of each other on the evening of the 28th. Mars is in Virgo at the first of the month and then crosses into Libra. It is still small and far away but approaching Earth. Look for it in the morning sky at magnitude 1.7 slowly increasing in brightness. Jupiter is difficult to see in the early evening sky and is in conjunction with the Sun on the 27th. Saturn is low in the southwest evening sky early and then becomes lost in twilight. Uranus (Οὐρανός) is in the evening sky in Aries. Neptune is in Aquarius and setting before midnight. Pluto is still in Sagittarius in the morning sky and very slowly moving east.

Constellations for the month – Once again starting at the southern reaches of the Maine sky we begin with the constellation Fornax, the Furnace. Fornax consists

of three 4th magnitude stars and a few dimmer stars you will probably miss if not looking carefully. If you have a low southern horizon and a good night you might look for the Fornax I Galaxy Cluster which does contain a few galaxies bright enough for viewing with moderate telescopes. This cluster 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 galaxy group. It is below the oxbow curve of 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° 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. 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. Included in Taurus is probably the most famous open cluster in the sky M45 aka Pleiades. Perseus, the Hero is next north. 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 8th mag. stars starting with open cluster NGC 1502 forming an equilateral triangle with beta (β) and alpha (α) 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 – Aldebaran is an orange giant star and one of the brightest stars in the sky ranking at number 14 with an average brightness of 0.87 magnitude. The star is often occulted by the moon. Astronomer Edmund Halley studied the timing of the 509 CE Athens lunar occultation of Aldebaran and compared it to a current occultation then noted the star had moved several degrees to the North within the stars of The Hyades. He also studied the changing positions of Sirius and Arcturus thus in 1718 discovered proper motion. We now know Aldebaran is not a member of The Hyades as it is located at a distance of 67 light years compared to The Hyades at 150 light years.

Featured Messier object – These are my personal observation notes of open cluster M37. "Most spectacular of the Auriga open clusters. Maybe as many as a couple hundred stars. A mixture of bright and dimmer stars in lanes. Very nice in my 25x100 binocular. This cluster contains the most stars of the Auriga clusters. Appears to have a general "V" shape." A little more investigation shows M37 to have many red-giant stars making it older than the young M36. Only one red-giant is obvious near the center of the cluster as color is not usually noted

Featured constellation – The head of Taurus the Bull is an open cluster "The Hyades" and our friend Aldebaran is the bull's mean red eye. It does not have a Messier designation. Messier probably thought it was large enough and the stars could not easily be confused with a comet. Taurus does however have some open clusters easily seen in a binocular or small telescope. A few years ago while casually scanning through this constellation with a binocular I first came across NGC 1647 5° NE of The Hyades and was surprised to find this nice little cluster of about 50 to 60 stars with several of them double. I later discovered the cluster actually contains about 200 stars when viewed with more powerful instruments. This one is easy to find and very impressive. Scan about 6°NE of 1647 and you will find what appears to be another open cluster but upon closer observation it is found to be three open clusters all superimposed upon each other (see above). Follow on out to the two horn tips of Taurus and go to the southern (and dimmer) of the two horn stars zeta (ζ) Tau. Slightly over 1° NNW you will find M 1 the Crab Nebula. This is the slowly expanding remnant of the super nova of 1054 observed by Chinese astronomers. Most telescope owners have observed M1 at one time or another and almost everyone has seen the excellent Hubble telescope picture of it.

Other objects of interest – Algol, beta (β) 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.

Get out your telescope. Observe the sky.
Bill Shackelford