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Penobscot Valley Star Gazers

An Astronomical Society of Central Maine

May 9

2003: Hayabusa launched,
first mission to retrieve a sample from an asteroid.



In Person in Orono

The PVSG meeting on Monday, May 9, 2022 will be held at the Maynard F. Jordan Planetarium at the Versant Astronomy Center at 6:30 pm. Masks will be required. For those who can't attend in person, the meeting will be on Zoom. Masks won't be needed by those attending remotely. As for the program, Shawn will give us two or three to choose from.

Thanks for last month's program go to Don for the video on astronomy basics and Phil for information on Global Astronomy Month.

Also, don't forget that this month is election month. The offices on the ballot are Secretary, Treasurer, and Member-at-Large.



A Few Basics

PVSG Monthly Meeting Minutes
April 11, 2022
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 meeting was brought to order by Don Ferrell at approximately 6:41 PM.

Attendance:

Members Online:

Don Ferrell - President
Andy Brown - Vice-President
David Clark - Treasurer
Phil Normand - Secretary
Dwight Lanpher - Member at Large / Club Liaison
Bill Shackelford
Shawn Laatsch
Wade & Donna Smith
Ralph Mallett
Ralph Foss

Guests:

Larry Berz

Presentation

Don showed a You Tube presentation on the History of Astronomy Part 1: The Celestial Sphere and Early Observations. Phil presented an Astro-short on April being the Global Astronomy month with information about what was taking place during the month as described in the Astronomers without Borders web site.

Secretary's Report and Acceptance of Minutes

Last month's minutes were approved unanimously.

Treasurer's Report

Dave stated we have \$326.17 in our checking account. Nothing pending until June when the Astronomical League dues need to be paid. Dave has dues from 1 person ready to deposit, but not yet in the bank.

Observing Reports:

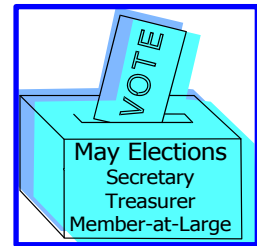
Don said he was planning to view the moon after the meeting. **Shawn** mentioned that nice observations were made a couple weeks ago at the Clark Observatory. **Larry** mentioned the morning planetary conjunction and Mercury appearing in the west at dusk. **Bill** mentioned that he will be attending the annual solar eclipse on October 14, 2023 in New Mexico.

Old Business

The group discussed upcoming elections and Don indicated that he hadn't heard from anyone other than those currently in office in regards to interest in the Secretary, Treasurer and Member at Large positions.

New Business

Shawn mentioned that if the club wanted to have an in-person meeting, that he could host that meeting at the Versant Astronomy Center for the May 9th meeting. Shawn also reminded the group of the upcoming Middle Atlantic Planetarium Society conference on May 18th to the 21st. If folks were interested in having observing sessions, the Clark Observatory would be open on the evening of the 18th & 19th and PVSG members could bring their own equipment to observe and share with the MAPS attendees.



Viewing would begin after 9:30 when the evening programs finish up.

The Versant Astronomy Center and Jordan Planetarium is a Community Partner with Webb First Light program and will be partnering with the Challenger Center for a first light event. They will announce the event as soon as the date is firmed up. This Webb First Light event will likely be mid-week in July with a more in-depth program to be offered in September.

Two additional events planned at the planetarium are: April 24th – Author Jamie Hogan will give a presentation and sign her book “Stargazer”; April 29th – as part of the Friday public showing, a meteorite specialist from the Maine Mineral and Gem Museum will have Martian meteorites for folks to view and handle.

If weather cooperates for the lunar eclipse in May, the Clark telescope will be open.

Scott stated that John Bapst is now allowing outside groups to meet at the school. Don also mentioned that the Bucksport church hall is still available to us on Mondays. Scott inquired if Zoom would be available there and Don was unsure.

The group had a discussion about having the May 9th meeting and how many people would attend. Seven people at the meeting indicated they would attend and Phil was tasked with sending out an email to the membership to see who would attend so that we would have sufficient attendance.

[Note: After getting responses by email, it was determined that the May meeting will be held at the Versant Astronomy Center.]

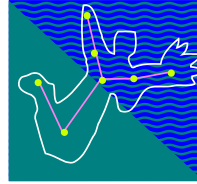
The group discussed having a laptop available for those who would connect by Zoom. Scott mentioned having a separate web cam on a tripod.

Shawn mentioned that the group needs to work on outreach and in particular trying to attract younger people. Dave mentioned that there have been attempts in the past. There was general agreement that we need to attract some younger members.

Adjournment

The meeting was adjourned at approximately 7:41 PM

Phil



Observe The Sky This Month Some Selected Objects May 2022

General sky comments –

Melotte 111 aka the Coma Berenices cluster, the constellation Virgo, and their galaxies are the main interest this month but there are also some double stars, planetary nebula, and globular clusters to observe. If you are unable to view Melotte 111 with a telescope at the least use your very best binocular to explore this magnificent star and galaxy cluster. I hope you observed the planet Mercury early in the month. It was the only time a planet was visible in the western sky until August. On the evening of May 15th and the morning of May 16th there is a total eclipse of the moon. Times are listed below. During the last week of May in the pre-dawn sky observe the planets Jupiter and Mars become closer together until on the mornings of the 28th through the 30th they are separated by less than the width of the full Moon. Particulars below. The Eta Aquarid meteors are active between April 19 and May 28. The peak was on May 6. Continue watching for the next few weeks. The radiant is located in the Water Jar of Aquarius.

Planets this month – Before the meeting on the 9th of May first quarter Moon was on Sunday the 8th, full Moon will be on Monday the 16th, last quarter is on Sunday May 22nd, and new Moon (lunation 1230) is on Monday May 30th. A total eclipse happens this full Moon and is the largest full Moon of the year. As a consequence it will be hyped as a Blood Super Moon. Although the eclipse begins at 09:21:30 EDT with the penumbral eclipse beginning most people will not notice anything happening until about 10:10 when this phase becomes noticeable for most observers. The partial eclipse begins at 10:27:12 EDT and totality begins at 11:28:21 EDT. The point of greatest totality is 12:11:10 EDT and the total phase ends at 12:53:59 EDT. Mercury is fading into the evening twilight early in the month. The waxing crescent Moon passes close to Mercury on the 1st and 2nd when the planet is at magnitude 0.4. Venus begins the month in the morning sky near Jupiter 9° from the sun, but soon pulls away. Venus is in close conjunction with the waning crescent moon on the 28th. Mars is in Aquarius early in the month passing into Pisces on the 19th. It passes only 0.6° south of Neptune on the 17th then the waning crescent Moon passes 3° to the south on the 24th. Mars is overtaking Jupiter and they have a close conjunction on the 28th – 29th being only 0.6° apart. Jupiter in the early morning sky remains close to Venus after the April 30th conjunction. Throughout the month it bridges the gap between Venus and Mars with the Moon joining them on the 24th – 25th. On the 28th – 29th Jupiter is 0.6° north of Mars and appears three magnitudes brighter. About the only way to observe this conjunction is with a binocular or a low to medium power telescope. Saturn

is in eastern Capricornus and shines at magnitude +0.8. The last-quarter Moon passes 4° south on the 22nd. Uranus was in conjunction with the Sun on the 5th and not easily observable. Neptune is in the morning sky in Aquarius going into Pisces. Pluto is in Sagittarius.

Constellations this month – If you want to see many galaxies or observe numerous Messier objects, this month and the next month are the times. The North and East side of Ursa Major as promised will be observed. Below Ursa Major is the constellation of Canes Venatici, the Hunting Dogs and its famous alpha star Cor Caroli. From Cor Caroli, alpha (α) Canes Venatici there are numerous observable galaxies. 4° NNW is M94 (NGC 4736) a spiral galaxy. 1¼° W of M94 is NGC 4618 (Arp 23) a barred spiral with a strange spiral arm. 1½° slightly north of W is the star beta (β) Canes Venatici. From there go ½° NW to a pair of interacting galaxies, NGC 4490 and NGC 4485 (Arp 269). Go back to Cor Caroli then 3° SE to NGC 5005 a spiral galaxy and only ¾° away SE is NGC 5033 another spiral orientated north to south. 5° NE of Cor Caroli is M63 the Sunflower Galaxy (NGC 5055) a beautiful spiral especially in a large telescope. (Discussed further with Messier object of the month.) If you have trouble getting to the Sunflower it is located just north of a grouping of three bright stars. From M63 go 3° west and slightly south to find M94 the “Cat’s Eye Nebula.” Also in Canes Venatici is M106. It is found easier from chi (χ) Ursa Major the next bright star below the bottom left corner star Phecda, gamma (γ) Ursa Major in the bowl of the asterism “The Big Dipper.” From chi go 5° slightly south of due west to M106 a spiral galaxy observed by Méchain but added to the Messier list in 1947 by Helen Sawyer Hogg. Look below in featured Messier object to find a discussion of Messier M63. Continuing in Ursa Major we will first note M109. To find M109 start at the before mentioned Phecda and go less than 1° SW to M109 a beautiful barred spiral galaxy similar to our own barred spiral the “Milky Way.” If you have never seen M40 the double star Messier placed in his catalog of objects not comets this is the time to observe it. Go to the top star of the bowl of “The Big Dipper” Megrez delta (δ) Ursa Major. From this star go 1° NW to the 5th magnitude star 70 Ursa Major then continue ¼° NW to this double star Winnecke4. There is a 12th mag galaxy to the west of M40 but this galaxy was beyond the capability of any telescope Messier had access therefore Messier must have meant this double star to be M40. Next to observe is M101. To find it go to the stars near the end of “The Big Dipper” the double stars Mizar and Alcor plus the star at the end of the handle Alkaid. M101 is located at the tip of an equilateral triangle NW of these stars each side 5½° long. M101 is large but because it is so large it can be difficult to observe. Use low power and a wide field of view. My best view has been with a large binocular. I have also observed NGC 5473 and NGC 5474 side galaxies to M101. NGC 5473 is located ½° NNW of M101 and NGC 5474 is located ¾° SSE of M101. Coma Berenices is below Canes Venatici a

constellation from ancient times known as the asterism representing the tuft on the end of the tail of Leo. It is now named for the hair of Berenices II queen of Ptolemy III Euergetes of Egypt who had sacrificed her hair to Aphrodite for the safe return of her husband from war. It was made a constellation by Tycho Brahe in 1607 and now listed as a modern constellation. To the Naked eye Coma is almost void of stars. You have to go to a dark site to see very many but what stars there are can help you find your way through “The Realm of the Galaxies.” This constellation along with Virgo contains well over 100 prominent galaxies and many more less prominent galaxies viewable with even modest telescopes (See below). The constellation of Virgo was the goddess of agriculture and most other people connected it with agriculture or fertility. Virgo contains the bright star Spica representing a head of grain held by Virgo. Finally we see the tail of Hydra and there is the constellations of Crater on it off to the west. Corvus is hovering above. We observed both of these last month. If you have a low observing sky the northern portion of Centaurus, the Centaur is just visible.

Featured star – Cor Caroli, Alpha (α) Canum Venaticorum is located a little over 14 degrees SW of the star at the end of the handle of the big dipper, Alkaid eta (η) Ursa Major. I will not cover who or why this star received its popular name Cor Caroli (Charles’ Heart) here. You can look up the two popular theories for yourself. Cor Caroli is a double star. The two are not the same color but it is difficult to tell the difference. Most consider them white and slightly yellow. It does not take a very powerful telescope to separate this pair. The dimmer of the pair is designated as Alpha (α) 1 at mag 5.6 and the brighter Alpha (α) 2 at mag 2.8. Alpha 2 is a star with two characteristics of interest. It is both a star with a very strong magnetic field and a star with a strong abundance of rare-earth elements. Stars with strong magnetic fields show The Zeeman Effect a splitting of spectral absorption lines. The Zeeman Effect was noticed in the europium lines at maximum magnetic intensity and when the polarity was reversed the chromium lines were at maximum intensity. The magnetic field seems to concentrate the rare-earth elements in the star but the origin of the magnetic field or the origin of the rare-earth elements is not known for certain. The current thinking is merging of neutron stars form rare-earth elements. Did this star result from a merging of neutron stars and somehow the strong magnetic field was a result? Just wondering. Did I mention both Cor Caroli Alpha 1 and Alpha 2 are also spectroscopic binaries? This is one mysterious star!

Featured Constellations – Coma and Virgo and all the galaxies they contain are quite a challenge but if taken in small sections they do not have to be overwhelming. I have found if you start with Vindemiatrix, epsilon (ε) Virgo a third magnitude star (and a good star chart) go approximately 1.5° slightly north of west you come upon a pair of galaxies NGC 4762 and NGC 4754 one an elliptical and one a spiral. These two types of galaxies are what you will see all through this

area although each galaxy will have variations. Once you have found this pair you are on your way into the Realm of the Galaxies. Continue 1.5° on the same line to the Messier galaxy M60, NGC 4649 an elliptical galaxy. This galaxy is slightly interacting with its neighbor NGC 4647 to form what the astronomer Halton Arp numbered as Arp 116. Continue on less distance this time to M59, NGC 4621 another elliptical galaxy. Continue on a little farther to M58, NGC 4579 one of the barred spiral galaxies in the Messier catalog. This galaxy is located next to an 8th mag. star. From M58 we now go NW the same distance we just traveled to find M89, NGC 4552 another elliptical. A little less distance this time NNE to M90, NGC 4569 a tipped spiral galaxy. While we are in the area let us pause and use this time to go twice as far as we just traveled to go NNW and find M91, NGC 4548 the other barred spiral. Return to M90. Are you lost or confused yet? I know people with a go to telescope are saying "What is the big deal?" but isn't this more challenging? I have a push to telescope but I don't use it all that often still preferring to star hop. From M90 go SSW a short distance to M89, NGC 4552 then proceed twice as far ESE to M87, NGC 4486 another elliptical galaxy characterized by its supsize and jet although it takes a very large telescope to see the jet. Pause here and get a cup of coffee because it is going to get interesting. From M87 proceed about 1° almost NW to a pair of Messier objects M86, NGC 4406 and M 84, NGC 4374 both elliptical. M84 is the smaller of the two. From this point we will follow a chain of galaxies starting at M84 called Markarian's chain named after Benjamin Markarian who discovered these galaxies all have a common motion. After M84 they are M86, NGC 4438 and NGC 4435 known as the eyes then NGC 4461, NGC 4473, NGC 4477, and NGC 4459. During this time we have crossed into the constellation Coma. From NGC 4459 go less than a degree NE to M88, NGC 4501, an open face spiral, then east to M91, NGC 4548 another of the Messier barred spirals. Back track to M88. From here the galaxies are farther apart. Almost 3° west is M99, NGC 4254 a grand design galaxy I imagine our Milky

Way might resemble. To get our bearings near here is the 5th magnitude star 6 Como. Less than 1° west of 6 is M98, NGC 4292 a more edge on spiral. Follow a string of 5th magnitude stars NE to M100, NGC 4321 another grand design galaxy. Don't miss this one. Above it and slightly east almost 2° is M85 an elliptical galaxy. There are two additional Messier galaxies in Virgo and then we will stop. 5° south of the Markarian chain of stars is a grouping of 6 magnitude stars. Between the two most prominent western stars is found M49, NGC 4472 an elliptical galaxy. Finally there is M61, NGC 4303 the third Messier barred spiral in this area. If you have found M49, M61 is almost 5° SSW. It is almost 5° north of eta (η) Virgo a 4th magnitude star. I hope you enjoyed pushing through all these galaxies and I hope you didn't become totally lost. By not using a go to telescope you better learn the sky.

Featured Messier object – M63 (NGC 5055) is found by locating Cor Corelli and proceeding 5.1° NE. Known as the Sunflower Galaxy it is elongated east to west with a coarse disk, a large tight core, and a compact stellar nucleus. There is a 9th magnitude star near the western tip of the visible disk and a trio of stars off the eastern side. M63 was discovered on June 14th of 1779 by Pierre Méchain his first deep sky object and observed later by Messier and added to his list. The spiral structure of M63 was first noticed by Lord Rosse with his 72" Leviathan and included in his list of 14 "spiral or curvilinear nebula" published as a paper in *Philosophical Transactions* in 1850. M63 is categorized as a flocculent spiral due to the curdled and patchy look of its disk. This makes tracing its spiral structure more difficult than grand design galaxies. It is thought this appearance is due to star forming regions or massive concentrations of molecular gas stretched into the spiral structure by differential rotation. To some the inner disk resembles the flowering head of a sunflower thus the name.

Bill Shackelford
Are we alone in this sky overhead?