

Vandenberg Amateur Astronomical Society presents The Sidereal Times



Nebulas, Flame and Horse (see page 5)

Meeting News:

At the March meeting we discussed requested support for Various organizations in the local area. Dave McNally held a Show and tell about new equipment for the observatory. Watched a video about Pluto courtesy Tom Gerald.

Reminder: VAAS club meeting April 13th at Manzanita School Teachers Lounge.



Lunar Calendar

New Moon 16th
Full Moon 1st & 30th

Girl scout day



Presidents Message

Hello, Fellow Sky Watchers!

Thank you for a productive and fun meeting in February. Following up on the business discussed, we have three outreach opportunities just around the corner this merry month of April. First comes Santa Maria's Jimenez Elementary School STEM Night on April 19th, from 6:00-8:00 PM. On Saturday, April 21st, is the Lompoc YMCA "Choose Your Own Adventure Day," which will run from 10:00AM-1:00PM. May 4th, we will be assisting Vince with this year's Allan Hancock Friday Night Science program. Vince says there will be plenty of telescopes but he needs us to help field questions and assist people. Then Nichelle Rourke will be bringing the Manzanita Third Grade students up to the Observatory in May on a date yet to be determined. WHEW!

And there is the much-anticipated Mars InSight program on May 3rd presented by JPL and cohosted by VAAS. A lot going on, but we are fully capable of giving a welcoming, knowledgeable presence at each of these and share our love of the heavens with young and older alike. Details of this and all these events will be discussed at our upcoming meeting.

Of course, as you already know: I will not be at this meeting. As much as I do hate missing out, I will be in the outback wilds of the Mojave with my buddy Ed Gregory on our Third Annual Desert Ramble. Yes, I will have the smaller of my telescopes with me. Hoping for even darker skies than we have had in Death Valley!

After enjoying the NOVA program so much at our last meeting, I close with an update on the New Horizons mission. After its historic fly-by of Pluto in July of 2015, its mission was extended to explore Kuiper Belt Objects (KBOs). In January of 2019 it will encounter KBO 2014 MU69, or "Ultima Thule" as it was recently nicknamed by NASA from names submitted by the public. Orbiting the sun some 1 BILLION miles beyond the orbit of Pluto, Ultima Thule will be the most primitive object ever visited by a spacecraft. Things to look forward to!

Thank you, Jana, for helping the April meeting, Tom!

Events

April 1st Canis Major observable in the early morning just after Sunrise in the constellation of Lompoc Ca.

Canis Major



April 7th *Star Party at the Observatory.*

😊 Yea!

April 14th *Star party at Figueroa Mountain or Observatory.*

😊 Yea!

April 21st *Star party at the Observatory.*

😊 Yea!

April 22nd & 23rd Lyrids meteor shower is an average shower producing about 20 meteors per hour at its peak. It is produced by dust particles left behind by comet C/1861 G1 Thatcher. It peaks on the night of the 22nd and Morning of the 23rd. Meteors will radiate from the constellation of Lyra but can appear anywhere in the sky.

April 29th Mercury will be at greatest western elongation of 27 degrees from the Sun. It will be at its highest point above the Eastern horizon in the morning sky just before Sunrise.

Star party's and Events

Mar 10th Star Party at the Observatory cancelled due to weather.



Mar 17th Star Party at the Observatory cancelled due to weather.



Mar 24rd Star Party at the Observatory. Cancelled due to weather.



Star Party for Local school



Astronomy Day



April 2018 Moon



Full 1st & 30th, New 16th, Last Quarter 8th, First Quarter 22nd.

Moon Folklore & Facts

The Moon is the fifth largest natural satellite in the Solar System.

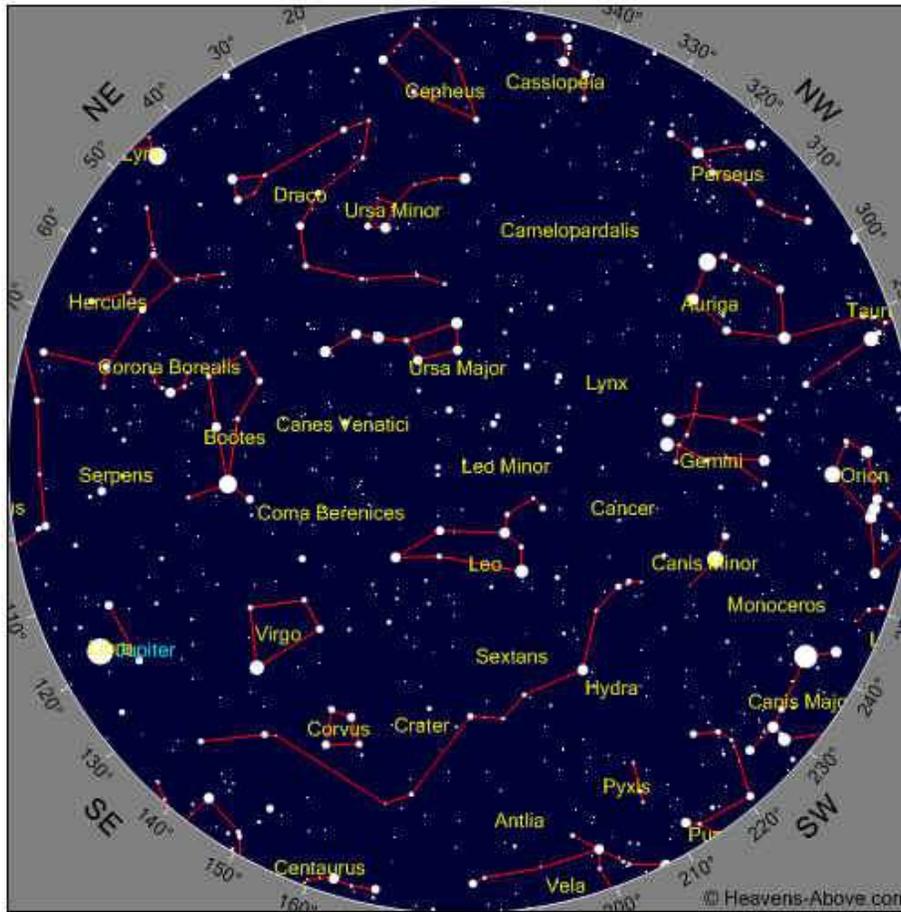
At 3,475 km in diameter, the Moon is much smaller than the major moons of Jupiter and Saturn. Earth is about 80 times the volume than the Moon, but both are about the same age. A prevailing theory is that the Moon was once part of the Earth, and was formed from a chunk that broke away due to a huge object colliding with Earth when it was relatively young.

The Moon is drifting away from the Earth.

The Moon is moving approximately 3.8 cm away from our planet every year. It is estimated that it will continue to do so for around 50 billion years. By the time that happens, the Moon will be taking around 47 days to orbit the Earth instead of the current 27.3 days.

April 2018 Sky

Some Objects of interest, M42, M1, Jupiter



Time

Year	2018	Month	4	Day	5	Hour	23	Minute	0
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Girl Scouts



Dave @ Figueroa Mt.



Photo Courtesy Vahan Yeterian



The Flame nebula NGC 2024 is an emission nebula in the constellation of Orion and is about 900 to 1500 light years distant. The bright star Alnitak shines energetic ultraviolet light into the Flame and this knocks electrons away from the great clouds of hydrogen that reside there. Much of the glow results when the electrons and ionized hydrogen recombine. Additional dark gas and dust lies in front of the bright part of the nebula and this is what causes the dark network that appears in the center of the glowing gas. The Flame nebula is part of the Orion Molecular Cloud Complex, a star forming region that includes the famous Horsehead nebula. At the center of the Flame nebula is a cluster of formed stars 86 % of which have circumstellar disks. X-ray observations show several hundred young stars out of a population of 800 stars. X-ray and infrared images indicate that the youngest stars are concentrated near the center of the cluster.

The Horsehead nebula known as Bernard 33 is a dark nebula in the Orion constellation. The Horsehead nebula is approximately 1500 lightyears distant. The shape of the swirling dark dust and gasses bears some resemblance to a horses head when viewed from Earth. The dark cloud of gas and dust is known to be a stellar nursery and can contain over 100 kinds of organic and inorganic gasses as well as dust. The red or pinkish glow originates predominately from hydrogen gas behind the nebula ionized by the bright star Sigma Orionis. Magnetic fields channel the gasses leaving the nebula into streams shown as streaks in the background glow. The heavy concentrations of dust in the region and neighboring Orion nebula are localized resulting in sections of nearly complete opacity and transparency. The darkness in the Horsehead is caused by thick dust blocking the light of stars behind it. The gaseous complex is an active site of the formation of low-mass stars. Bright spots in ther Horsehead nebula's base are young stars just in the process of forming.

Image capture, Astro-Tech AT80EDT f/6 ED refractor, Canon T3i Rebel /Baader modified, integration time .5 hours ISO 800, Celestron AVX mount. Software DSS 3.3.4

For What its Worth

Globular Clusters:

A globular cluster is a spherical collection of stars that orbits a galactic core. They are very tightly bound by gravity which gives them their spherical shapes and relatively high stellar densities toward their centers. The name of this category of star cluster is derived from the Latin Globulus (a small sphere). Globular clusters are found in the halo of a galaxy and contain considerably more stars and are much older and less dense than open clusters which are found in the disk of a galaxy. Globular clusters orbit the galaxy at a radii of 40 kiloparsecs (130,000 light-years or more).

Globular clusters are densely packed collections of ancient stars. Roughly spherical in shape they contain hundreds of thousands of stars. Studying them helps estimate the age of the universe or figure out where the center of the galaxy is. There are about 1250 known globular clusters in the Milky Way galaxy. Most are estimated to be at least 10 billion years old and contain some of the oldest stars in the galaxy. Clusters likely formed very early before the galaxy flattened into a spiral disk. Some Globular clusters such as Messier 13 can be seen with the naked eye. With telescopes the stars in the cluster can be looked at much closer. They are mostly low-mass red stars and intermediate-mass yellow stars none more massive than 0.8 solar masses. Some general observations are they are found in every direction in the sky. The density of stars in a Globular is much greater than density of stars around the Sun. Globular clusters do not contain any gas. The abundance of any elements heavier than helium is only 1 to 10 % of the abundance of the same elements in the Sun. Globular clusters formed from giant molecular clouds, or huge masses of gas that form stars as they collapse.

Globular clusters cannot form today because there is less free gas available now. While you can see multiple generations of stars in the cluster what happens is the subsequent generations evolve from the first one. The first set of stars gobble up most of the gas then as they die (millions of years later) they eject the gas. This means that the age difference between different star cluster generations is small.

The younger stars have heavier elements and more helium than their older companions and different motions. The original population is more centered in the globular while newer stars slowly diffuse outward. Each globular moves as a whole within its host galaxy but within the cluster the stars also move individually and randomly. The individual motions of the stars act as a shield that stops them from crashing into each other. However gravity also acts as a glue to stop the cluster from flying apart.

Globular clusters also rotate, but not as much as a galaxy such as the Milky Way. That's because the original gas cloud of which the clusters were created was also not rotating rapidly. A slight rotation is apparent in the clusters because they are a little flattened, showing the motion. A typical rotation is between 5 to 10 kilometers per second (3 to 6 miles / second). By contrast the Milky Way rotates at 250 kilometers per second (155 miles / second). The first two Globular clusters officially discovered and named were Messier 22 in Sagittarius and Omega Centauri in Centaurus. M22 was a notable find not only for its early discovery but also for the ages of the stars within it. The stars range between 12 billion and 13 billion years old which date it close to the formation of the universe.

Messier 22 (M22)



Omega Centauri



Club Officers



President
Tom Gerald



Vice President
Jana Hunking



Treasurer
Andy Wallace



News Letter Editor
Vahan Yeterian

*“Astronomy compels the soul to look upward,
and leads us from this world to another”.*
(Plato)



Club Meeting

Reminder Club meeting Apr. 13th at 7:00Pm
Manzanita School teachers Lounge.
Star Parties (as always weather permitting)

Other Astronomy Club Meetings

Central Coast Astronomical Society

Link to web site...

<http://www.centralcoastastronomy.org/>

Santa Barbara Astronomical Unit

Link to web site...

[http:// www.sbau.org/#AU_EVENTS_Calendar](http://www.sbau.org/#AU_EVENTS_Calendar)

Night Time Bright Objects (no scope required)

Link to “Heavens Above” web site

[http:// www.heavens-above.com/](http://www.heavens-above.com/)

(Iridium Satellite)

(ISS Visible Pass)

Be sure to set the nearest location from their
pull-down menu.

The web site link below will take you to some
Great Milky Way interactive images and how
It was developed. (Type it in the search box.)

<http://skysurvey.org/>

VAAS.

Dave McNally is the VAAS Web Site Serf/Minion

Dave

