

Vandenberg Amateur Astronomical Society
presents
The Sidereal Times



Rosette Nebula (see page 5)

Meeting News:

At the November meeting we discussed some general VAAS Business and events.

Reminder: VAAS club meeting Friday December 14th at Manzanita School Teachers lounge 7:00 PM.

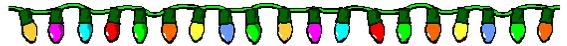


Lunar Calendar:

New Moon 7th
Full Moon 22nd



Presidents Message



Greetings, Friends!

As we near the end of another year, this is naturally a time of reflection. I was looking back at last year's December Newsletter and saw that I started my note to you by talking about surprises that had come my way the previous month. Well, your president's world took an amazing turn on November 19th, with the arrival-- one month early-- of a new grandson, Sammy Banister. As Molly and I have been taking care of his two-year-old sister, you can imagine how different my life has been for the past week!

Very special thanks to all of you who turned out for Miguelito Elementary School's first Astronomy Night. Amber, Joel, Candy, Danny, Louise, Jana, Vahan, and I brought telescopes, laptop photos, and a lot of enthusiasm to help the school have a successful event. Thanks to VAAS, many children and their parents had their first telescopic views of our Moon, Saturn, and Mars.

Looking forward to seeing you at our next meeting, December 14th. This will be our "Christmas Party" gathering, so bring goodies to share with each other along with fun conversation. Skyward,
Tom



Events

December 1st *Star Party at the Observatory.*



December 8th *Star Party at the Observatory.*



December 13-14th Geminids Meteor shower is the King of the meteor showers producing up to 120 multicolored meteors per hour. It is produced by debris left over by an asteroid known as Phaethon it peaks on the night of the 13th and morning of the 14th. Meteors will radiate from the constellation of Gemini but can appear anywhere in the sky.

December 15th *Star Party at the Observatory.*



December 15th Mercury at greatest Western elongation of 21.3 degrees from the Sun. Mercury will be at its highest point above the Eastern horizon. Look for Mercury low in the sky just before sunrise.

December 21st December Solstice occurs at 22:23 UTC. The Sun will be directly over the tropic of Capricorn at 23.44 degrees South latitude. First day of Winter in the Northern Hemisphere and first day of Summer in the Southern Hemisphere.

December 21-22nd Ursids meteor shower is a minor meteor shower producing about 5 –10 meteors per hour. It is produced by dust grains left behind by Comet Tuttle. It peaks on the night of the 21st and morning of the 22nd. Meteors will radiate from the constellation of Ursa Minor but can appear anywhere in the sky.



Star party's and Events

November 3rd Star Party at the Observatory. On site were Dave, Vahan, Joel, Candy and Danny. Was a bit overcast at 6:00 Pm but by 7:15 Pm it cleared up. The Milky Way was commanding the sky. The evening was warm and no wind or bugs. Joel set up his LX 200 10 inch SCT. Did a star alignment and looked at M2, M30, M57, M5, M27, M45, M13, Alberio, Mars and Saturn. Dave worked the observatory and had a problem with the Gemini Controller, it lost its settings and the real time clock was scrambled. Removed the controller and took it home for repair and battery replacement. Shut down and secured the observatory. Every one had a great time chatting and viewing the selected objects with Joel's LX200. It was a good night under the stars, secured at 11:00 Pm.



November 10th Star Party at the Observatory. 5:30 Pm Vahan, Dave, Danny, Joel and Candy on site. Lots of smoke in the air from the fires. Some stars were visible but not worth setting up for observing. We stuck around and had several interesting conversations and then decided to depart. Secured the Observatory and departed 7:15 Pm.



November 14th VAAS supported an Outreach event at local elementary school astronomy night. Tom, Jana, Joel, Candy, Vahan, Louise, Amber and Danny in attendance. Three telescopes were setup and one laptop for exhibiting Astro photos. The event lasted from 5 to 8 Pm. The Moon and Saturn were the main event and the weather was good. It was well received by the Children and Faculty.

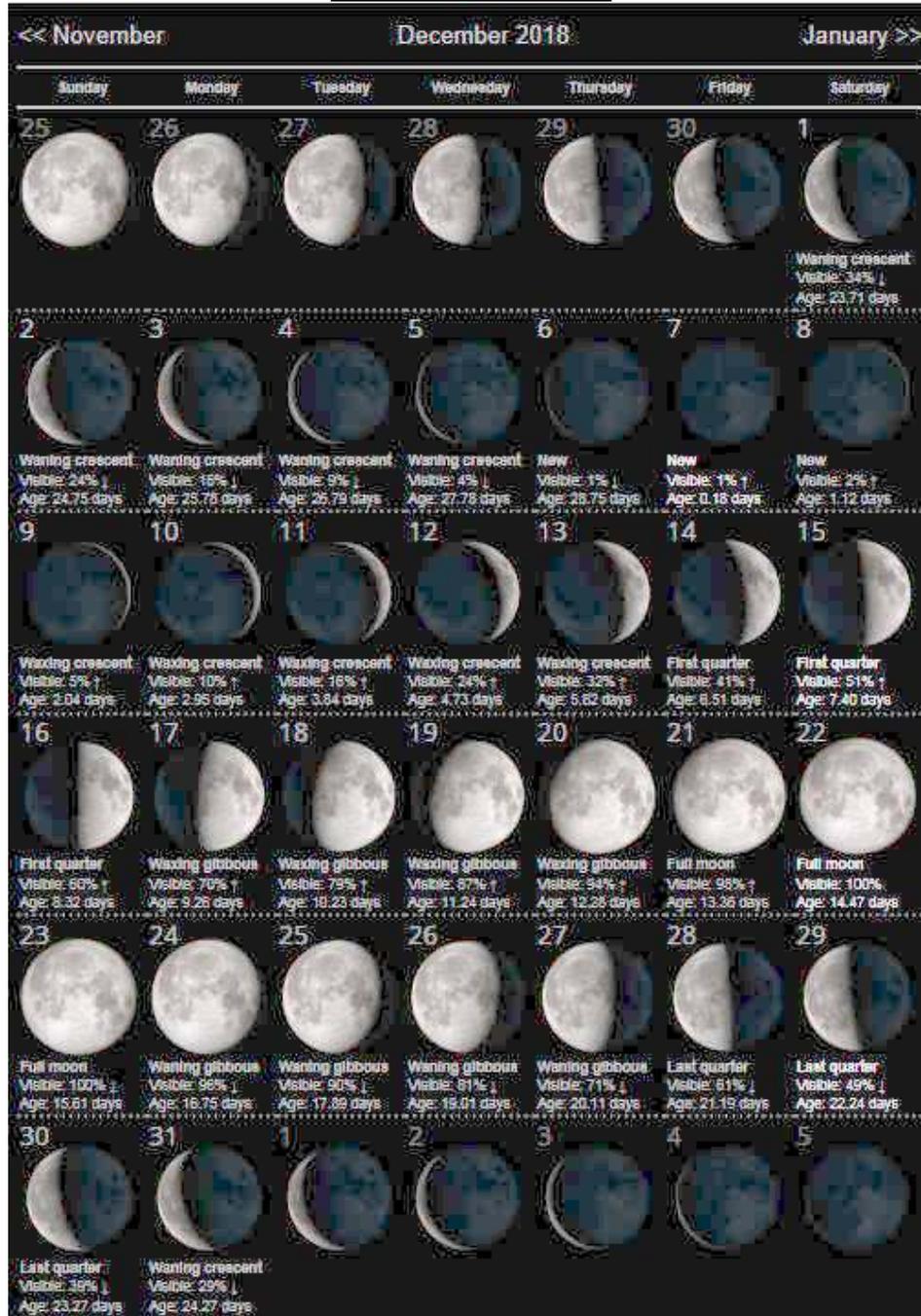
Outreach 14 Nov



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



December 2018 Moon



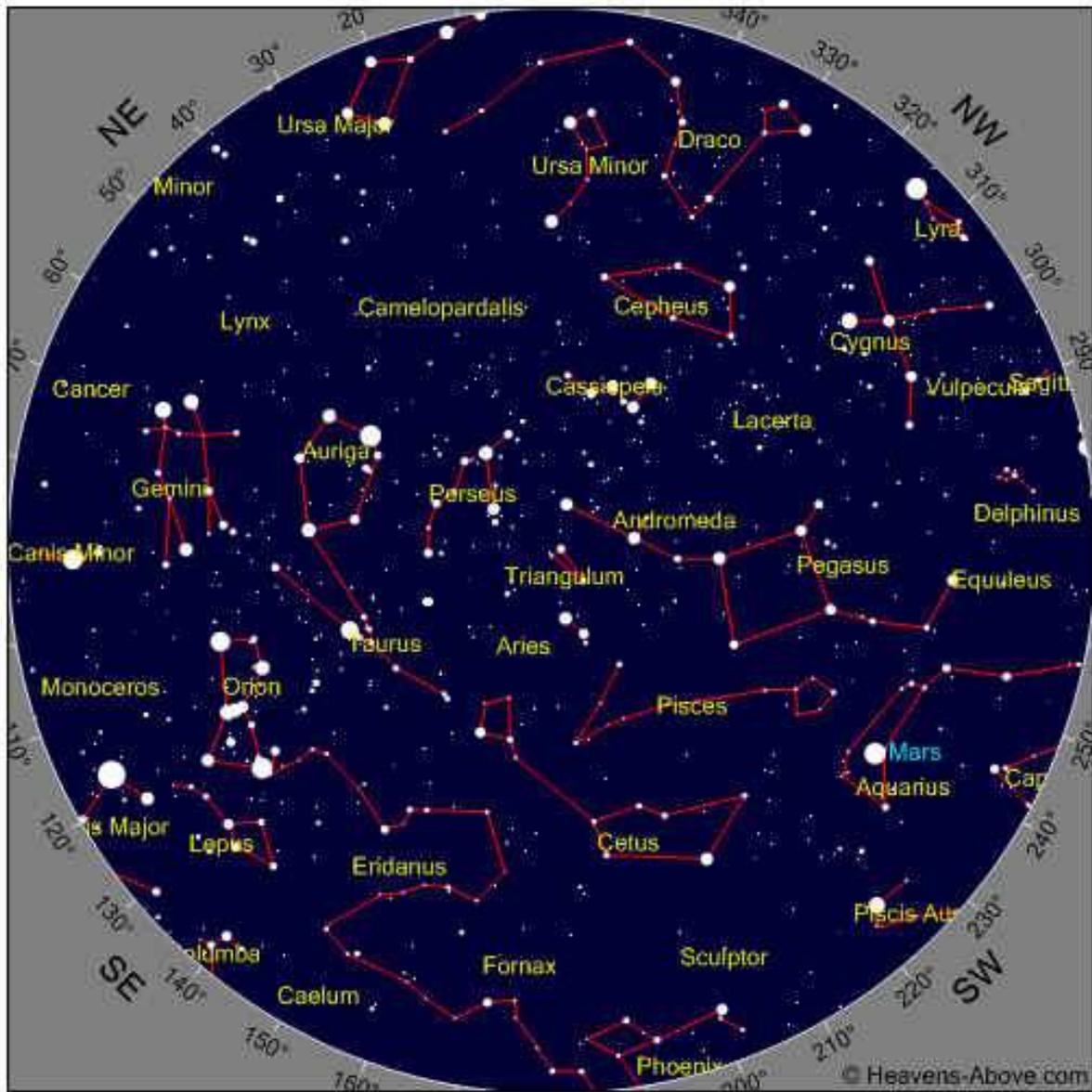
Full 22nd, New 7th, Last Quarter 28th, First Quarter 15th.

Moon Facts

The moon is the Earth's only natural satellite and was formed 4.6 billion years ago some 30-50 million years after the formation of the solar system

December 2018 Sky

Some Objects of interest, M31, M13, Mars, Saturn



Time

Year	2018	Month	12	Day	5	Hour	21	Minute	19
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Photo Courtesy David McNally



The Rosette nebula also known as Caldwell 49 is a large spherical Nebula in appearance. H II region located near one end of a giant molecular cloud in the Monoceros region of the Milky Way galaxy. The open cluster 2244 (Caldwell 50) is closely associated with the nebulosity, the stars of the cluster having been formed from the nebula's matter. The complex has the following NGC designations.

NGC 2237 – Part of the nebulous region (also used to denote the whole nebula)

NGC 2238 – Part of the nebulous region.

NGC 2239 – Part of the nebulous region (discovered by Herschel)

NGC 2244 – The open cluster within the nebula (discovered by Flamsteed)

NGC 2246 – Part of the nebulous region

The cluster and nebula lie at a distance of some 5000 light years from Earth and measure roughly 50 light years in diameter. The radiation from the young stars excites the atoms in the nebula causing them to emit radiation themselves producing the emission nebula we see. The mass of the nebula is estimated to be around 10,000 solar masses. A survey of the nebula with the Chandra X-ray observatory has revealed the presence of numerous new-born stars inside the optical Rosette nebula and studded within a dense molecular cloud. Altogether, approximately 2500 young stars lie in this star-forming complex, including the massive O type stars HD 46223 and HD 46150 that are primarily responsible for blowing the ionized bubble. Most of the on going star formation activity is occurring in the dense molecular cloud South East of the bubble. A diffuse X-ray glow is also seen between the stars in the bubble which has been attributed to super hot plasma with temperatures ranging from 1 to 10 million Kelvin. This is significantly hotter than the 10,000 K plasmas seen in H II regions likely attributed to shock heated winds from massive O-type stars. Image capture by Sigma 170-500 telephoto lens, Canon T3i Baader modified, Celestron hyper tuned CGEM mount. Integration time 0.7 hours frames 20x120", DSS software.

For What its Worth

Black Holes (general)

In general relativity an event horizon is a region in space-time beyond which events cannot affect an outside observer. In layman's terms it is defined as the shell of "Points of no return", ie, the boundary at which the gravitational pull of a massive object becomes so great as to make escape impossible. An event horizon is most commonly associated with black holes. Light emitted from inside the event horizon can never reach the outside observer. Likewise, any object approaching the horizon from the observers side appears to slow down and never quite pass through the horizon, with its image becoming more and more red shifted as time elapses. This means that the wavelength of light emitted from the object is getting longer as the object moves away from the observer. The traveling object, however, experiences no strange effects and does in fact pass through the horizon in a finite amount of proper time. Both light time and mass are stretched called spaghettification, in an event horizon your head would be ahead of you whereas the rest of your body would be expanded by light and time like a spaghetti noodle. If you were to talk into an event horizon at one end your words would be at 240 words per second and at the other end it would sound much like normal human speech.

The Black Hole

A black holes mass is concentrated at a single point deep in its heart, and clearly cannot be seen. The hole that can, in principal, be seen (although no-one has ever actually seen a black hole directly) is the region of space around the singularity where gravity is so strong that nothing not even light, the fastest thing in the universe, can escape and where time dilation becomes almost infinite. A black hole is therefore bounded by a well defined surface or edge known as the event horizon within which nothing can be seen and nothing can escape because the necessary escape velocity would equal or exceed the speed of light (a physical impossibility). The event horizon acts like a one way membrane similar to the "point of no return" a boat experiences when approaching a whirlpool and reaching the point where it is no longer possible to navigate against the flow. Or, to look at it a different way, within the event horizon space itself is falling into the black hole at a normal speed greater than the speed of light.

Event Horizon

The event horizon from a black hole from an exploding star with a mass of several times that of our own Sun would be perhaps a few kilometers across. However, it could then grow over time as it swallowed dust, planets and stars and even other black holes. The black hole at the center of the Milky Way, for example, is estimated to have a mass equal to about 2,500,000 suns and have an event horizon many millions of kilometers across. Materials such as gas, dust and other stellar debris that has come close to a black hole but not quite fallen into it forms a flattened band of spinning matter around the event horizon called an accretion disk. Although no one has actually seen a black hole or its event horizon this accretion disk can be seen because the spinning particles are accelerated to tremendous speeds by the huge gravity releasing heat and powerful x-rays and gamma rays out into the universe as they smash into each other.

Accretion Disks

These accretion disks are also known as Quasars (Quasi Stellar Radio Sources). Quasars are the oldest known bodies in the universe and with the exception of gamma ray bursts the most distant objects we can actually see as well as being the brightest and most massive, out shining trillions of stars. A quasar is a bright halo of matter surrounding and drawn into a rotating black hole effectively feeding it with matter. A quasar dims into a normal black hole when there is no matter left around to eat.

Non Rotating Black Hole

A non-rotating black hole would be precisely spherical, however, a rotating black hole (created from the collapse of a rotating star) bulges out at the equator due to centripetal force. A rotating black hole is also surrounded by a region of space-time in which it is impossible to stand still and is called the ergosphere. This is due to a process known as frame-dragging whereby any rotating mass will tend to slightly "drag" along the space-time immediately surrounding it. In fact space-time in the ergosphere is technically dragged around faster than the speed of light (relative, that is, to other regions of space-time surrounding it). It may be possible for objects in the ergosphere to escape from orbit around the black hole. But once within the ergosphere they cannot remain stationary.

Due to the extreme gravity around a black hole an object in its gravitational field experiences a slowing down of time, known as gravitational time dilation relative to observers outside the field. From the viewpoint of a distant observer an object falling into a black hole appears to slow down and fade approaching and never quite reaching the event horizon. Finally at a point just before it reaches the event horizon it becomes so dim that it can no longer be seen, all due to the time dilation effect.

Club Officers



President
Tom Gerald

Vice president
& Treasurer
Jana Hunking



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 December 14th 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://skysurvev.org/>

Dave McNally is the VAAS Web Site Serf/Minion

Dave

