

# Vandenberg Amateur Astronomical Society presents The Sidereal Times



Flame & Horse Head (see page 5)

### Meeting News:

At the Oct meeting we discussed the annual VAAS picnic and the VAAS Brochure, also a brief on observatory maintenance.

**Reminder:** VAAS club meeting November 11th  
7:00 Pm Manzanita School, teachers lounge.

### Lunar Calendar:



New Moon Nov 29th  
Full Moon Nov 14th



### Presidents Message

I would like to thank the VAAS members for supporting our annual Picnic that was held at River Park last Oct 15. Rain was in the forecast, and as we were leaving, a light rain began, but we still had about 20 people that enjoyed the delicious steak BBQ that Vahan bought and grilled for us, along with his beans and French bread. We had a great variety of tasty salads, and 2 chocolate desserts that seemed to vanish quickly. It seemed a fun time for all, visiting with each other and our new potential member and his family, Andy & Lisha Wallace and their 3 adorable children.

The club is getting more requests for our outreach programs such as the Los Flores Park in SM have sent these dates for their star parties, Dec. 3, Jan7, March 4. Any support we can give them is appreciated.

Also, on Jan. 21 at the Zaca Mesa Winery, we have told them we would be there with telescopes and be ready for indoor lectures if it rains. Let us know if you are interested in helping out.

At the Nov. meeting, Tom Gerald will be presenting the latest info on our new brochure he is designing for our club. We hope to get that going by December. Jana will be giving a short presentation on Meteorites and will bring a few for all to observe. We are asking the members to think about a short-5-10 min. talk to the club about any astronomy subject that they feel that they would like to share with us at our meetings. Let me know by email before the last week of the month, so we can get it in the newsletter.

We will be having elections for officers at the Nov. meeting. If you are wishing to help us out as an officer, please let us know! See you at our next meeting on Veterans Day Friday, Nov. 11.

Wishing now for rain, Except on our star party nights! Jana

## Events

### Nov 5th Star party at the Observatory.



**Nov 4 & 5** Taurids meteor shower is a long running minor meteor shower producing only about 5 – 10 meteors per hour. It is unusual in that it consists of 2 separate streams. The first is by dust grains left over by asteroid 2004 TG10, the second by debris left over by comet 2P Encke. It peaks this year on the night of Nov 4<sup>th</sup>. Meteors radiate from the constellation of Taurus but can appear anywhere in the sky.

**Nov 16 & 17<sup>th</sup>** Leonids meteor shower producing about 15 meteors per hour. It is unique in that it has a cyclonic peak every 33 years when hundreds of meteors per hour can be seen. The last occurred in 2001. It peaks this year on the night of the 16<sup>th</sup> and morning of the 17<sup>th</sup>. It is produced by dust grains left over by comet Tempel -Tuttle. Meteors radiate from the constellation of Leo but can appear anywhere in the sky.

### Nov 19th Star Party at the observatory.



### Nov 26th Star Party at the Observatory.



## Star Party and Events

**Oct 1<sup>st</sup>** Star Party at Figueroa Mt. Vince Tobin and Craig Fair on site. Vince with his 16 inch Dob and 4 inch comet catcher for visual observing. Craig had his C 9.25 inch SCT and CGEM mount and set up for Astro photography. Some of the objects were M33 Triangulum galaxy, M16 Eagle Nebula and NGC 7331 galaxy. Several other galaxies were observed. Seeing and weather was good. Was a good night under the stars.



**Oct 8<sup>th</sup>** Star Party at the observatory. Vince Tobin, Craig Fair, Dave McNally and Vahan on site. Scattered high clouds moved in for awhile and the Moon was a bit on the bright side. Craig Set up his Celestron SCT and CGEM mount, Vahan his 12” Dob, Vince with his 6” scope and Dave ran the observatory. Lots of visual observing with all the scopes, Moon Mars, Venus, Double Cluster and M31 to name a few. Took turns viewing through all the scopes. It was a good night under the stars.



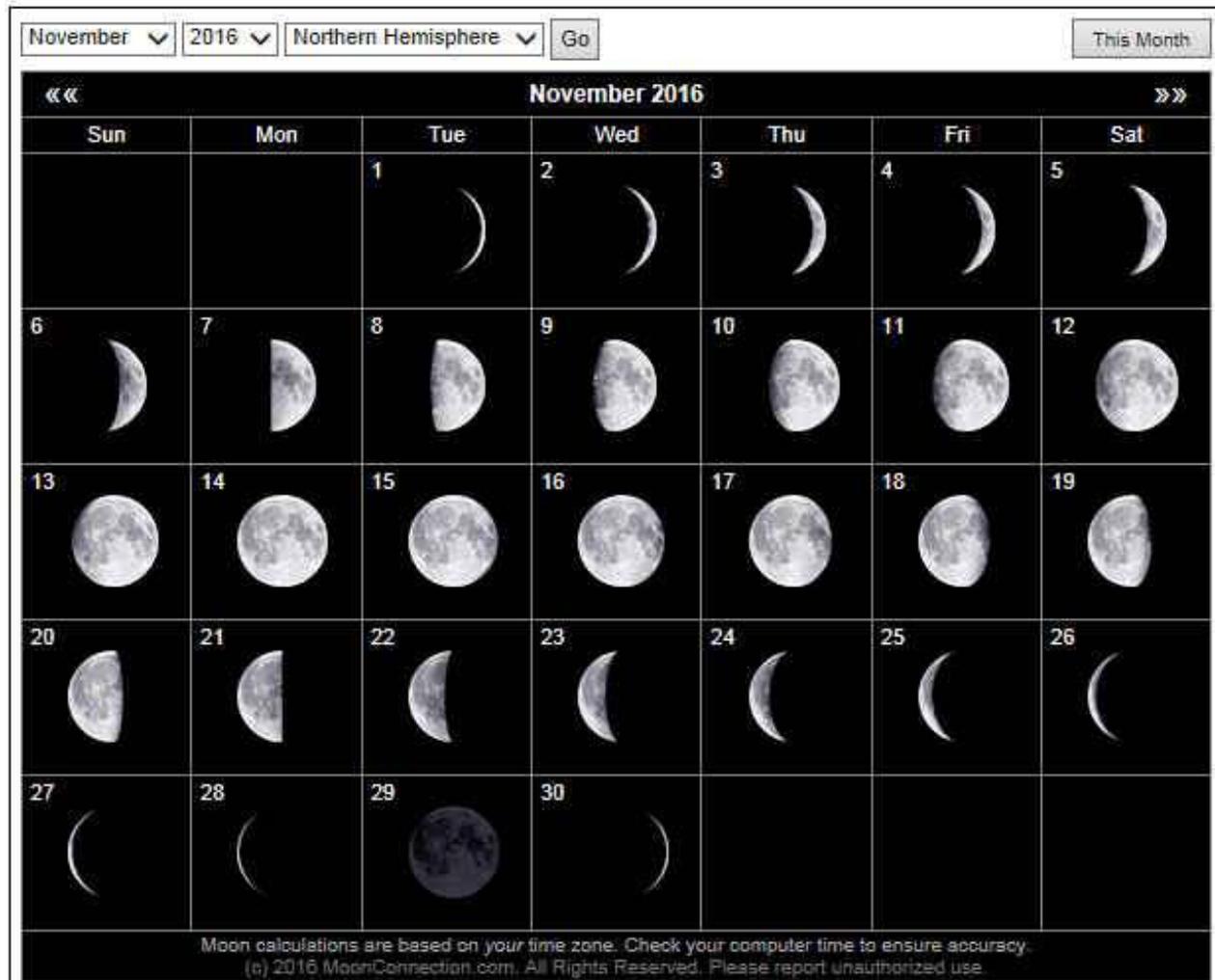
**Oct 15<sup>th</sup>** VAAS annual picnic was held at river park. 21 members and family were in attendance. It was a cloudy and slightly damp day (rain earlier) but pleasant and comfortable temperature wise. BBQ Tri-tip, beans, and garlic bread were the main course. Many members bought salads, casseroles, and various pastry to share with the membership. Vince brought a Lunt solar telescope for all to view the Sun but the overcast sky would not cooperate. All had a good time and enjoyed the BBQ and camaraderie.



**Oct 22<sup>nd</sup>**. Claiborne & Churchill Winery. Vince Tobin only one from VAAS and from CCAS were Joseph, Steve and Scott. Had a few fingers of fog now and then but we were still able to image Alberio, Ring Nebula, Andromeda galaxy, double cluster, Venus, Saturn and Mars. Dew was a problem. Visitors enjoyed the astronomy event with our equipment. Was a good event.



## November 2016 Moon



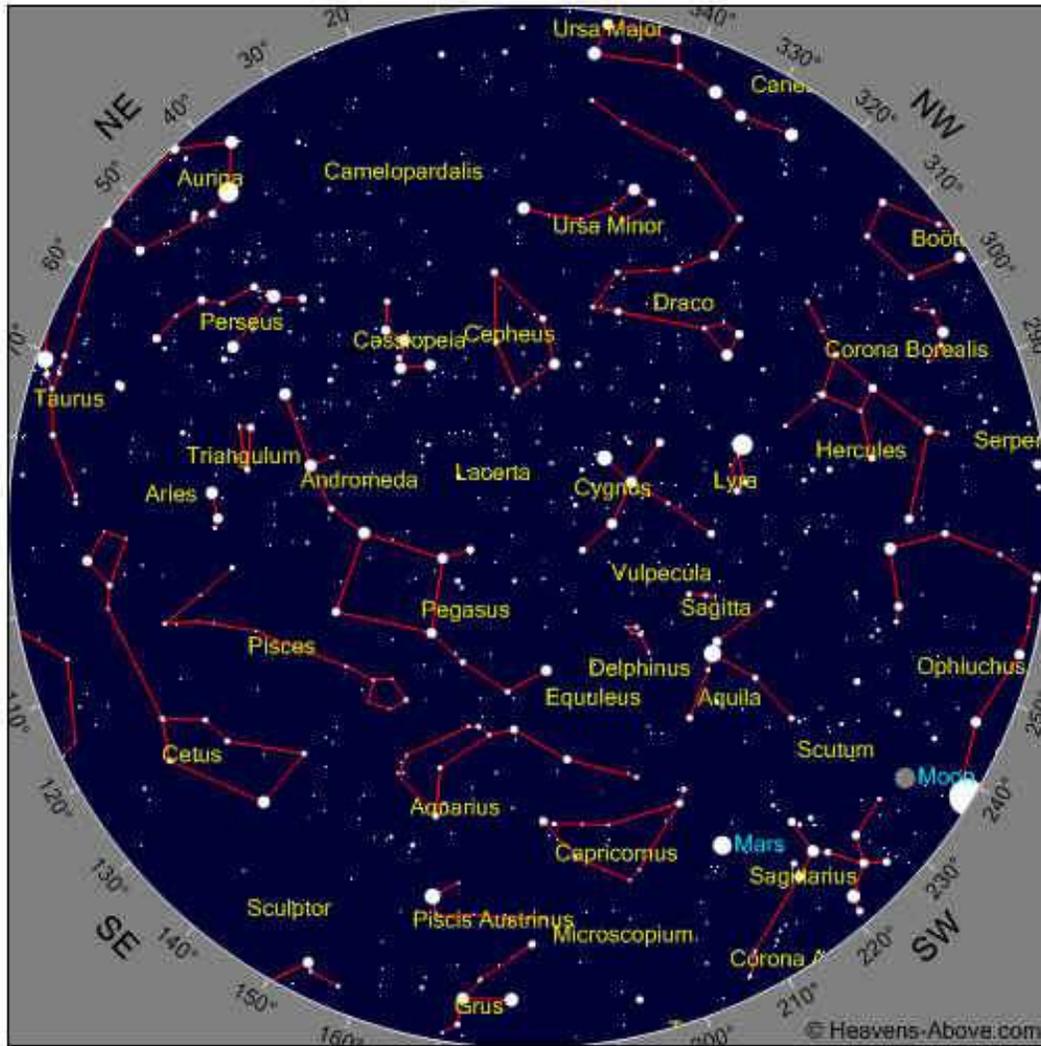
Full 14th, New 29th, 1<sup>st</sup> Quarter 7th, Last Quarter 21st

### Moon Facts

Both sides of the Moon see the same amount of Sunlight, however only one side of the Moon is seen from Earth. This is because the moon rotates around its own axis is exactly the same time it takes to orbit the Earth meaning the same side is always facing Earth. The side facing away from Earth has only been seen by the human eye from Spacecraft.

The Moon is drifting away from Earth about 3.8 centimeters per year. It is estimated that it will continue to do so for about 50 billion years. By the time that happens the Moon will be taking around 47 days to orbit Earth instead of the current 27.3 days

## November 2016 Sky



### Time

Year	2016	Month	11	Day	3	Hour	20	Minute	3
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**Photo Courtesy Jon Walke**



The Flame Nebula NGC 2024 is an emission nebula in the constellation of Orion about 1500 light years distant. The bright star Alnitak (Zeta Orionis) shines energetic ultra violet light into the flame and knocks electrons away from the great clouds of hydrogen gas. Much of the glow results when the electrons and ionized hydrogen recombine. 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 newly formed stars 86% of which have circumstellar disks.

The Horse head nebula also known as Barnard 33 is a dark nebula and is located South of the star Alnitak, it is also a star forming network. This stellar nursery can contain over 100 known kinds of organic and inorganic gases as well as dust made up of a complex of organic molecules. The pinkish glow originates from hydrogen gas behind the nebula and ionized by the bright stars magnetic fields. The darkness of the Horsehead is caused mostly by thick dust blocking light from the stars behind it. It is an active site of low mass star formation. The Horsehead nebula is thought to be 3 to 4 light years tall and 2 to 3 light years across.

Horsehead and Flame nebula 8 November 2015 @ 0940 UTC, C8 1280mm f/6.3, 600mm w/PHD2 guide. T3 mod ISO 1600 3x300s lights 20darks/40 bias/40 flats.



## For What its Worth

### Averted Vision

Another effect of the difference between rods and cones comes from both their relative sensitivity to light and their placement within the retina. When dark adapted, rods are nearly 40 times more sensitive to light than cones. This allows them to see four magnitudes fainter than the cones. However, since the cones are concentrated in the middle 10% of the retina and the rods are almost exclusively outside this zone, the eye is least sensitive in the center of its vision and more sensitive to light falling outside the middle of the eye.

Averted vision is a technique where the observer intentionally looks to the side of an object rather than directly at it. This places the light from the object onto the rods rather than the cones, increasing the ability to see it. Most of the rods are concentrated just outside of the center of the retina, the peak occurring about 20° off axis. This implies the best view of an object will occur when it is slightly, but not excessively, offset from the center of vision. There is a blind spot in the eye, where the optic nerve attaches. This blind spot sits about 15° to 20° away from the center of the eye, in the direction of the ear. Observers should thus avert their vision in the direction of the nose to avoid placing the light from the object onto the blind spot.

### Dark Adaptation

Everyone is familiar with the effect of the pupil opening wider upon entering a dark room. This change takes only a few seconds, as you can see using a mirror, a dark room, and too much free time. The pupil opens from about 2mm to 7mm. This increases the light gathering ability of the eye only about 12 times. This is certainly not sufficient to account for the huge range of brightness the eye can accommodate.

In addition to the physical change of widening the iris to allow more light in, there are chemical changes that take place to account for a several-thousand-fold increase in sensitivity. A chemical called rhodopsin is generated as the eye adapts to the dark. The greater the amount of rhodopsin, the greater the sensitivity of the rods and cones. Most of the chemical change occurs within half an hour. This amount of time should be allowed by the observer for dark adaptation before trying to observe very dim objects. Dark adaptation continues for as much as two hours. The ability to dark adapt is affected by exposure to bright light beforehand. Spending long periods of time outdoors in bright sunlight can hinder the ability to fully dark adapt for as much as several days.

### Pupil Size

As mentioned above, the pupil can expand through a range of diameters, from less than 2mm to as much as 8mm. As we age, the pupil's maximum size decreases. The average adult observer will most likely have a maximum pupil size of 7mm. Older observers may only have 4-6mm maximum pupil diameters.

Pupil size affects a number of aspects of observing. Foremost it determines the size of the beam of light the eye can accept. If the beam coming from the telescope (the exit pupil) is larger than the pupil of the eye, some of the light is blocked and the effective aperture of the telescope is reduced. For example, if an 8" telescope is used at 25x, the exit pupil will be 8mm. If the observer only has a pupil size of 6mm, the effective aperture of the telescope is reduced to 6".

The image quality of the human eye (ignoring for now any defects such as astigmatism, etc.) is determined by the diameter of the pupil. A larger pupil diameter increases the aberrations present in the eye. While there is little to be done to control the pupil size of the eye while observing, what can be controlled is the exit pupil of the telescope. Even if the observer's eye is opened to 7mm, if the exit beam from the eyepiece is smaller, only that much of the eye is used, and the effect is the same as if the pupil were actually opened to that size. For example, a 2mm exit pupil uses only 2mm of the eye, even if the actual pupil size is much larger. Significant aberrations such as astigmatism are very dependent on exit pupil size. Since these types of aberrations tend to minimize as the eye's pupil shrinks, using higher magnifications on a telescope has the effect of using a smaller portion of the eye and thus reducing aberrations. For this reason, most observers with astigmatism find they must wear their glasses (or use corrective optics on the eyepiece) when viewing at low powers and correspondingly large exit pupils. However, when viewing at high power, glasses may not be required due to the reduction in apparent aberration thanks to the smaller exit pupil

## *Club Officers*



**President  
Jana Hunking**



**Vice President  
Tom Gerald**



**Treasurer  
Vince Tobin**



**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 Nov 11th at 7:00Pm  
Manzanita charter School.

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

