VAAS Website: www.vaas.universeii.com/ 2, January 2019

Vandenberg Amateur Astronomical Society presents The Sidereal Times

Messier 33 Galaxy (see page 5)

Meeting *News:*

At the December meeting we discussed some general VAAS Business and events we supported during the month of Nov. And Dec. Also the VAAS New Year party in January

Reminder: VAAS club meeting Friday January 11th Manzanita school teachers lounge 7:00 PM.

Lunar Calendar:

New Moon 6th
Full Moon 21st

Presidents Message

Hello, Fellow Stargazers:

Well, another year comes to a close. 2018 was a year frustratingly filled with many a Star Party aborted by overcast skies, but still having some great opportunities for viewing and sharing with others. A leisurely cruise back through the Newsletters from the past twelve months shows that we had a very productive and enjoyable year.

Looking forward, however, February's meeting will feature Dr. Joe Bassi's return. Dr. Bassi has entertained us on two other occasions, first discussing Space Weather and later the history of modern rocketry and manned space flight. In his next presentation, using JPL slides, Joe will recap the Mars Insight Mission from launch to landing and update us on InSight's current activities.

I look forward to seeing all of you at our January Pizza Party/Meeting. While the club provides the pizza, but sure to bring check or cash to renew your annual Membership Dues. Responding to requests by members, we are seeking a new venue and an invitation with location will follow very soon!

In closing, I call your attention to the discovery in November of the most distant object now known to be orbiting our sun. According to "Sky & Telescope News," the object designated 2018 VG18 [humorously nicknamed "Farout"] orbits between 115 and 125 au [astronomical units] or roughly three and a half times the distance of Pluto! The discovery was made by three astronomers who were attempting to ferret out the Fabled "Planet X," the theorized object which seems to be influencing the orbits of several distant members of our solar system. All to say: there is so much more we do not know about our universe than that which we do know, so stay tuned for many new revelations across the coming years.

Skyward,

Tom Gerald, President
VAAS

Events

Jan 3 & 4 Quadrantids Meteor shower is an above average shower with up to 40 meteors per hour at its peak. It is thought to be produced by dust grains left behind by an extinct comet known as 2003 EH1. It peaks this year on the night of the 3rd and morning of the 4th. The Meteors will radiate from the constellation of Bootes but can appear anywhere in the sky.

Jan 5th ***Star Party at the Observatory***.

Yes!

Jan 6th The Planet Venus at greatest Western elongation of 47 degrees from the Sun. It will be at its highest point above the horizon in the morning sky. Look for the planet in the Eastern sky before Sunrise.

Jan 6th Partial Solar Eclipse. The partial eclipse will be visible in part of Eastern Asia and the northern pacific ocean. It will be seen from North Eastern Russia with 62% coverage.

Jan 12th ***Star Party at the Observatory***.

Yes!

Jan 21st Full Moon Super Moon occurs at 05:16 UTC. This is also the First of 3 Super Moons for 2019. The Moon will be closest to Earth And may look slightly larger and brighter than usual.

Jan 22nd Conjunction of Venus and Jupiter. The two bright planets will be within 2.4 degrees of each other in the morning sky. Look for this impressive sight in the East just before Sunrise.

Jan 26th ***Star Party at the Observatory.***

Yes!

Nov 14th Miguelito school Astronomy Night

Star **party's and Events**

December 1st Star Party cancelled due to weather (rain).

Nuts!

December 8th Star Party cancelled, weather!

Nuts!

December 15th Star Party at the Observatory. Vahan, Vince and Danny on site. Vince had 4 adults and 8 children visiting some of the adults were Vince's students. The sky was obscure with clouds and fog but the Moon and Mars were visible. All of the group enjoyed viewing the Moon and Mars and had a short lecture about the observatory until the weather closed in completely. Secured and departed at 8:oo Pm.

Yea!

Nov 14th Miguelito School Astronomy night

January 2019 Moon

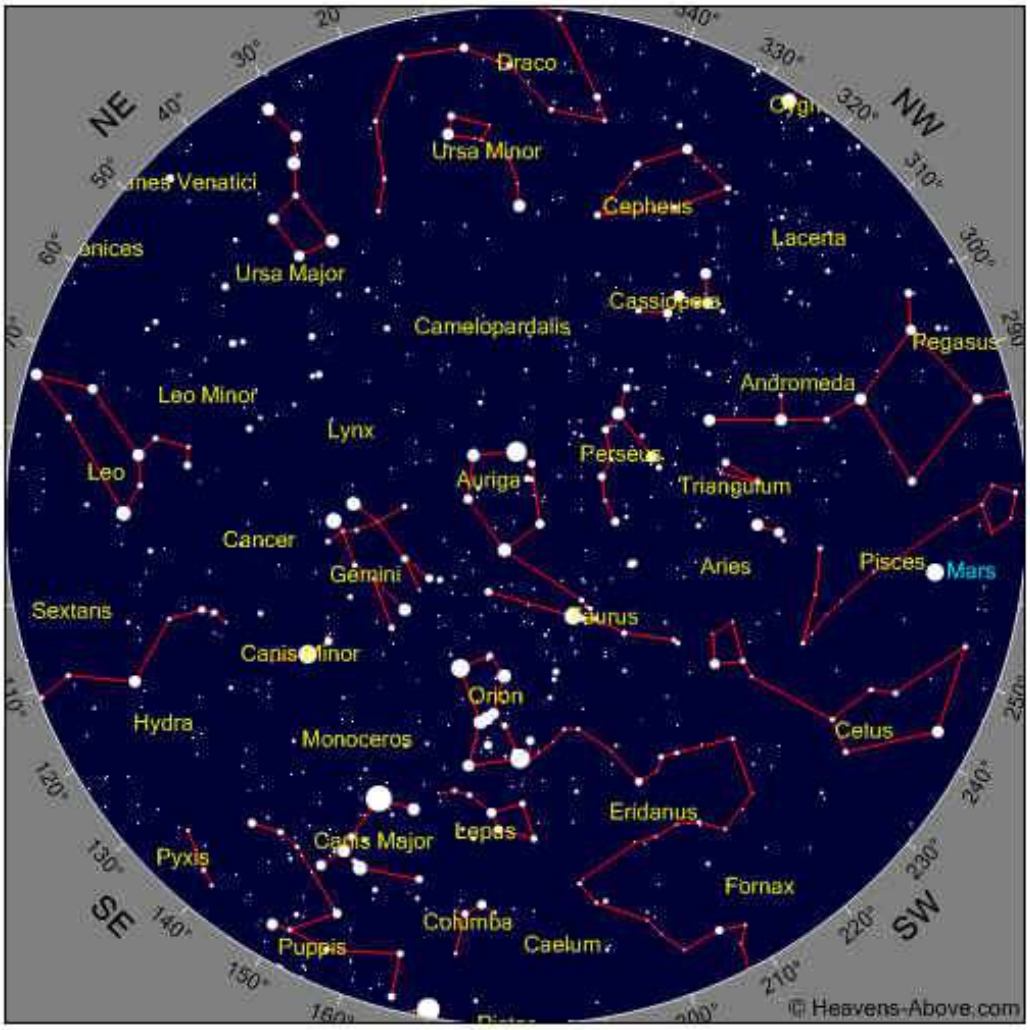
Full 21st, New 6th, Last Quarter 27th, First Quarter 14th.

Moon Facts and Folklore

The Moon's largest crater is 1600 miles in diameter.
It is the Aitken Basin impact crater and is on the far side of the Moon.

January 2019 Sky

Some Objects of interest, M31, M42, M1



Time

Year 2019	Month 1	Day 10	Hour 21	Minute 57

Nov 14th Miguelito School Astronomy Night

Photo Courtesy Gary Satterfield

M33 NGC 598 Triangulum galaxy is approximately 2.723 million light years distant and contains approximately 40 billion stars. It is the 3rd largest galaxy of the local group of galaxies behind the Milky Way and Andromeda galaxies. It is the most distant permanent object (galaxy) that can be viewed with the naked eye. It is the smallest spiral galaxy of the local group and is believed to be a satellite of the Andromeda galaxy due to their interaction, velocities and proximity to one another. It also has an H-ll nucleus a diameter of 60,000 light years and is roughly 40% the size of the Milky Way galaxy. A comparison of star population exhibits about 40 billion stars compared to the Milky Way 400 billion and the Andromeda galaxy's 1 trillion stars. The combined mass of all baryonic matter in the galaxy may be 10 to the 10th solar masses. In 2006 a group of astronomers announced the discovery of an eclipsing binary star in the galaxy. The Triangulum galaxy is the source of Water Maser emissions. Observation of two water masers on the opposite sides of M33, researchers for the first time, were able to estimate the angular rotation and proper motion of the galaxy. A velocity of 190+/-60 kilometers per second relative to the Milky Way was computed which means that Triangulum is moving toward the Andromeda galaxy. Evidence was around a clumpy stream of hydrogen gas linking Andromeda with Triangulum that suggests that the two may have tidally interacted in the past. A distance of less than 300 kiloparsects between the two supports this hypothesis. Star formation is taking place at the rate that is strongly correlated with the local gas density and rate per unit area. Image capture by an AT65EDO scope with a modded Canon 500D on a hypertuned CGEM mount and ImagesPlus camera control guiding with a mini Borg50 and SBIG St-I mono using PHD2. The CGEM mount is controlled with NexRemote and wireless Logitech Rumble pad. Image data: 29 x 600 sec frames @ ISO 200. Bias, Flats and Darks. Processing with PixInsight.

For What its Worth

Supernovas

Supernovas are among the most powerful and spectacular events in the universe. Most of the changes that take place happen very, very slowly in human terms. For example it took millions of years for our solar system to form and another 4.5 billion years for intelligent life to evolve on one of its planets. Our Sun is only about half way through its expected lifetime. A supernova happens in only about 15 seconds. A supernova is the biggest explosion you can imagine, the brilliant dying gasp of a star that is at least 5 times more massive than our Sun. A star is a balancing act between two large forces. On the one hand, the crushing force of the star's own gravity tries to squeeze the stellar material into the tightest smallest ball possible. But on the other hand the force of the tremendous heat and pressure from the nuclear fires burning at the stars center tries to push all the material outward. When the star has used up all its nuclear fuel the outward pressure is no longer able to counteract the gravity and the star suddenly collapses. Imagine something one million times the mass of Earth collapsing in 15 seconds! The collapse of the core happens so fast that it makes enormous shock waves that blow the outer part of the star into space at 20,000 kilometers per second (50 million miles per hour). Usually a very dense core is left behind along with an expanding cloud of gas called a nebula. Stars that are more than about 10 times the size of our Sun may leave behind the densest objects in the universe – Black Holes.

Supernova are not very common. In galaxies like our own Milky Way about 2 to 3 supernovas occur each century. From Earth's location in the Milky Way galaxy, interstellar dust blocks our view of many of them. Because the universe contains so many galaxies, astronomers observe a few hundred super nova per year outside our galaxy. They can be seen virtually to the edge of the universe. These fantastic events can be so intense that they can outshine their entire galaxy for a few days or even months. The ageing of stars is well enough understood that astronomers can predict when a star will become a supernova, and we know that none of the stars in our neighborhood of the Milky Way will put on such a spectacular display soon.

It is fascinating to realize that the massive stars that become supernovas are factories for producing and distributing all the raw materials to make everything else. Inside their cores the nuclear fusion reactions create nearly all the atoms that make up planets, moons, asteroids and us. The carbon in your proteins, calcium in your bones, oxygen you breathe, iron in your blood and almost all the atoms in your body were manufactured inside a star. But ordinary stars don't get hot enough to make any atoms heavier than iron. To make heavier elements like gold, silver lead and mercury require the very special conditions of pressure and heat that exist inside a supernova during those few seconds of collapse. Then the rebound explosion as the star blows itself apart flings all those elements into space. Eventually the material that is dispersed through space collects and forms a new star and new planets. The new solar system is supplied with all the resources for making planets like Earth, with the iron for the core, materials for rocky surface and for the air as well as all the ingredients that can make plants and animals – all of it having been created in stars at the moment of supernova and all of it released from the star during the supernova explosion.

Type 1 Supernovas

Type 1 supernovas lack a hydrogen signature in their light spectra. They are generally thought to originate from white dwarf stars in a close binary system. As the gas of the companion star accumulates onto the white dwarf, the white dwarf is progressively compressed and eventually sets off a runaway nuclear reaction inside that eventually leads to a cataclysmic supernova outburst. Astronomers use Type 1a supernovas as "standard candles" to measure cosmic distances because all are thought to blaze with equal brightness at their peaks. Type 1 supernovas also undergo core collapse but they have lost most of their hydrogen envelopes.

Type 2 Supernovas

For a star to explode as a Type 2 supernova it must be several times more massive than the Sun (estimates run from 8 to 15 solar masses). like the Sun it will eventually run out of hydrogen and then helium fuel at its core. However, it will have enough mass and pressure to fuse carbon. What happens next is heavier elements build up at its center and it becomes layered like an onion with elements becoming lighter towards the outside of the star. Once the stars core surpasses a certain mass the star begins to implode (known as core collapse supernovas). The core heats up and becomes denser and eventually the implosion bounces back off the core expelling the stellar material into space forming the supernova. What's left is an ultra dense object called a neutron star, a city sized object that can pack the mass of the sun in a small space. Sub categories of type 2 supernovas are based on their light curves. Type II light declines steadily after the explosion while type II-P stays steady for a time before diminishing. Both types have the signature of hydrogen in their spectra. Such stars more massive than the Sun (about 20 to 30 solar masses) might not explode as a supernova but instead they collapse to form black holes.

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 January 11th 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

Night Time Bright Objects (no scope required)

Link to "Heavens Above" web site
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/

Dave McNally is the VAAS Web Site Serf/Minion

Dave