

# Astronomy Club of Lompoc Presents The Sidereal Times



Eagle Nebula (see page 5)

### Meeting News:

At the December ACL Club meeting we had some Xmas Cookies and a general discussion about the past year meetings and where and when our annual New Year Pizza party will be. Also after the meeting we had a little star party with Vince and his Meade SCT out in the school parking lot.

**Reminder: ACL club meeting January 14<sup>th</sup> 7:00PM  
Manzanita School Teachers Lounge.**

### Lunar Calendar

New Moon 21<sup>st</sup>  
Full Moon 6<sup>th</sup>

Photos in this issue exhibit past various ACL activities.



### Presidents Message

**Happy New Year** to all our Lompoc Astronomy Club Members! I am happy to be your President again, after 5 years, and I would like to officially **Thank Tom Gerald** for leading us through some difficult 2 years of the Covid Pandemic lockdown, having to zoom our meetings with each other and try to hold our small club together when we could not gather in person as a social club needs. I feel **Tom did a great job as our leader**, and during his 5 years, he brought in great speakers like Dr. Bassi, and our club participated in various NASA events, Lompoc city, and VSFB events. Tom- with our appreciation you deserve a well-deserved Rest!

One goal I would like to pursue for our club, is for all our members to actively encourage their friends and the public to join our club as we need to build up our membership.

With the help of our members, we need to discuss possible speakers and topics to be covered for our meetings. Also goals of what you would like our club to accomplish for this coming year.

With the virus season starting early Masks at the meeting will be optional. On Dec 8 I came down with Covid and shared it with my husband who got sick with it 5 days later. We were not very sick - more like a 5 day flu, since we had all of our vaccines and boosters....(thank goodness!) Too many concerts and parties the week before....even though I enjoyed every one of them!

The January skies will be beautiful with our clear winter nights. Observe our larger planets, and even look upon the first Super Moon on Jan 21. Grab your coat and take a look with just the sweep of your eyes, binoculars, or your scope this month. Hopefully we can start up more Star Party nights.

Your New President for 2023, Jana Hunking

## Events

**January 8, and 22** -*Star Party at the Observatory*



Yea!

**January 3 & 4** Quadrantids Meteor Shower is an above average Shower with about 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. Meteors will radiate from the constellation of Bootes but can appear anywhere in the sky.

**January 30<sup>th</sup>** Mercury at greatest Western Elongation of 25 degrees from the Sun. It is best time to view Mercury since it will be at its highest point above the horizon in the morning sky. Look low in the Eastern sky just before Sunrise.

**Solar scope at the ACL picnic**



**Kate's New Scope**



## Star party's and Events

**December 17, 23, 31** Star Party at the Observatory cancelled due to weather, rain, wind and very cold weather.



Nuts!

**School Display**



**Solar Star Party**



## January 2023 Moon



Full 6<sup>th</sup>, New 21<sup>st</sup>, Last Quarter 15<sup>th</sup>, First Quarter 28<sup>th</sup>.

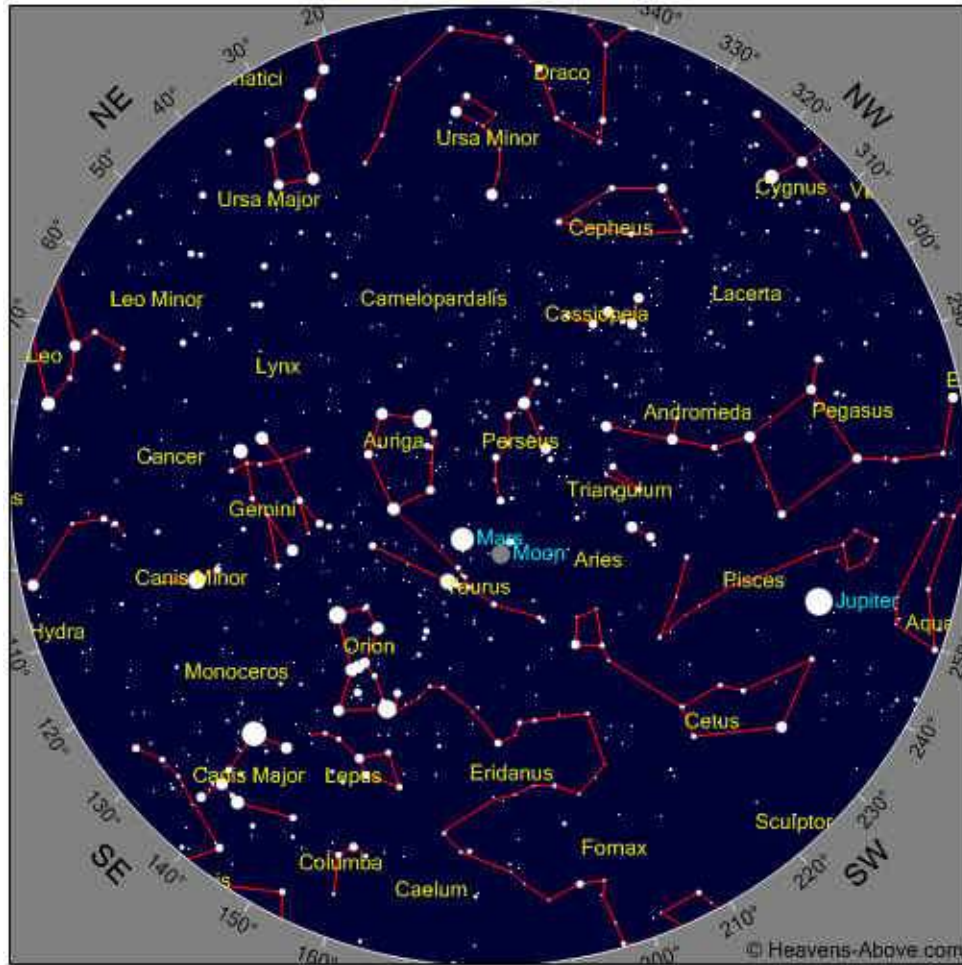
### Moon Facts and folk lore

A full day on the Moon, one sunrise to the next, last about 29.5 days.  
 The Moon is moving away from Earth by 3.8cm (1.48 inches) per year.  
 If there are 2 full moons in the same month the second is called a Blue Moon.  
 The ring around the Moon is caused by refraction of Moonlight from ice crystals in the upper atmosphere.  
 Folklore has it that a ring around the Moon signifies bad weather is coming.



## January 2023 Sky

Some Objects of interest, M31, C14, M42, M1, Mars



### Time

Year	2023	Month	1	Day	2	Hour	21	Minute	15
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Observatory Bunch



VAFB Display



Photo Courtesy of my friend Steven



Messier 16, NGC 6611, the Eagle Nebula in the constellation of Serpens is about 7000 light years distant. It is a diffuse emission nebula or H II region and appears to be a current active star formation region. The brightest star in the nebula HD168076 has an apparent magnitude of 8.24 and is a binary star formed of O3.5V plus an O7.5 V companion. The cluster associated with the nebula has approximately 460 stars, the brightest of O type and a mass of 80 solar masses. Its luminosity is up to one million times of the Sun. Its age is approximately 1 to 2 million years. M16 contains several star forming regions including the “Pillars of Creation”. The interstellar hydrogen gas and dust act as incubators for new stars. Evidence from the Spitzer telescope suggests the “Pillars” in M16, may have been destroyed by a supernova explosion some 8000 or 9000 years ago. The more slowly moving shock wave would have taken a few thousand years to move through the nebula and would blow away the delicate “Pillars”. The light showing us the destruction will not reach us for another millennium.

Setup Ken's Scope



Show and Tell for School Kids



## **For What its Worth**

Based on the direction and speed of our galaxy and Andromeda at some point during the next few billion years, our galaxy and Andromeda – which also happen to be the two largest galaxies in the Local Group – are going to come together with catastrophic consequences. Stars will be thrown out of the galaxy, others will be destroyed as they crash into merging super massive black holes. And the delicate spiral structure of both galaxies will be destroyed as they become a single giant elliptical galaxy. But as cataclysmic as this sounds this sort of process is actually a natural part of galactic evolution. Astronomers have known about this impending collision for some time.

Astronomers look out into the universe they see galaxy collisions happening on a regular basis. Galaxies are held together by mutual gravity and orbit around a common center. Interactions between galaxies is quite common, especially between giant and satellite galaxies. This is often the result of galaxies drifting too close to one another, to the point where the gravity of the satellite galaxy will attract one of the giant galaxies primary spiral arms. In other cases the path of the satellite galaxy may cause it to intersect with the giant galaxy. Collisions may lead to mergers, assuming that neither galaxy has enough momentum to keep going after the collision has taken place. If one of the colliding galaxies is much larger than the other it will remain largely intact and retain its shape while the other smaller galaxy will be stripped apart and become party of the larger galaxy. Such collisions are relatively common and Andromeda is believed to have collided with at least one other galaxy in the past. Several dwarf galaxies such as the Sagittarius Dwarf Spheroidal galaxy are currently colliding with the Milky Way and merging with it. However, the word collision is a bit of a misnomer since the extremely tenuous distribution of matter in the galaxies means that actual collisions between stars or planets is extremely unlikely. In 1929, Edwin Hubble revealed observational evidence which showed that distance galaxies were moving away from the Milky Way. This led him to create Hubble's Law, which states that a galaxy's distance and velocity can be determined by its red shift – i.e. a phenomena where an objects light is shifted toward the red end of the spectrum when it is moving away. However, spectrographic measurements performed on the light coming from Andromeda showed that its light was shifted towards the blue end of the spectrum (blue shift). This indicated that unlike most galaxies that have been observed since the early 20th century, Andromeda is moving toward us. In 2012 researchers determined that a collision between the Milky Way and the Andromeda galaxy was sure to happen based on Hubble data that tracked the motions of Andromeda from 2002 to 2010 based on measurements of its blue shift. It is estimated that Andromeda is approaching our galaxy at a rate of 110km/second (68mi/sec). At this rate it will likely collide with the Milky Way in about 4 billion years. These studies also suggest M33, the Triangulum Galaxy – third largest and brightest of the Local group – will participate in this event as well. In all likelihood it will end up in orbit around the Milky Way and Andromeda then will collide with the merger remnant at a later date. In a galaxy collision, large galaxies absorb smaller galaxies entirely, tearing them apart and incorporating their stars. But when the galaxies are similar in size – like the Milky Way and Andromeda – the close encounter destroys the spiral structure entirely. The two groups of stars eventually become a giant elliptical galaxy with no discernible spiral structure. Such interactions can also trigger a small amount of star formation. When the galaxies collide, it causes vast clouds of hydrogen to collect and become compressed, which can trigger a series of gravitational collapses. A galaxy collision also causes a galaxy to age prematurely, since much of its gas is converted into stars. After this period of rampant star formation, galaxies run out of fuel. The youngest hottest stars detonate as supernovae, and all that's left are the older, cooler red stars with much longer lives. This is why giant elliptical galaxies, the results of galaxy collisions, have so many old red stars and very little active star formation. Despite the Andromeda Galaxy containing about 1 trillion stars and the Milky Way containing about 300 billion, the chance of even two stars colliding is negligible because of the huge distances between them. However, both galaxies contain central super massive black holes, which will converge near the center of the newly-formed galaxy. This black hole merger will cause orbital energy to be transferred to stars, which will be moved to higher orbits over the course of millions of years. When the two black holes come within a light year of one another, they will emit gravitational waves that will radiate further orbital energy, until they merge completely. Gas taken up by the combined black hole could create a luminous quasar or an active nucleus to form at the center of the galaxy. And last, the effects of a black hole merger could also kick stars out of the larger galaxy, resulting in hypervelocity rogue stars that could even carry their planets with them. Today, it is understood that galactic collisions are a common feature in our universe. Astronomy now frequently simulate them on computers, which realistically simulate the physics involved – including gravitational forces, gas dissipation phenomena, star formation, and feedback.



*Astronomy Club Officers*



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Vice President  
Tom Gerald



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*ACL Webmaster*  
Serf / Minion Aaron Anderson  
(New Zealand)



Club Meeting

**Reminder** Club meeting January 14<sup>th</sup> 7:00 Pm  
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)



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

*ACL Club Logo*

