

Astronomy Club of Lompoc Presents The Sidereal Times



Eagle Nebula (see page 5)

Meeting News:

At the December ACL Club meeting we had a presentation by Dr Bassi. Had an update from Jana on the January ACL meeting. It will be held at 6:00Pm at Mi Amore Pizza for our NewYear party. ACL pays for the Pizza and some extras, drinks are funded by the individual ACL member.

**Reminder: ACL club meeting January 14th 6:00PM
Mi Amore Pizza in Lompoc, South West corner of H
and Central Ave. 6:00 PM.**



Lunar Calendar

New Moon 2nd
Full Moon 17th

Photos in this issue exhibit past various ACL activities.



Presidents Message

Hello, Friends,

As I write here at the kitchen table, looking out on a surprisingly bright day, I am aware that the light out there is a slice of what is technically the shortest day we will see for the next year. Winter Solstice is here and, once again, I contemplate the marvel that our world rocks away from, back toward, and past vertical every year as it circles the Sun. This top-like wobbling gives us the seasons and is one of the factors that makes life itself possible on this, so far as we at this moment know, the only human-habitable planet in the entire universe. Think about it: all the seemingly miraculous circumstances that have combined to allow this one planet to engender and support life as we know it. Put in that perspective, we humans are carrying a huge burden of responsibility to care for each other and actually the entire universe. That caring is actually a commission to explore, learn, nurture, and respect all of creation. Think on these things as we begin a New Year.

Speaking of our Sun, how about those sunspots? I have been observing sunspots regularly since the day Vahan presented me with a white-light filter he had crafted for my little 2" Meade refractor, back in 2014. For several years that filter mainly stayed packed safely in my gear box as there were absolutely no "blemishes" to be observed. Recent months have delightfully changed that. Checking Spaceweather.com this morning, I find there are nine identified sunspot systems, with another large one about to roll into view. As Dr. Bassi made so clear in his recent Zoom presentation to the Club, our sun is an astoundingly dynamic world; currently we are being treated to ample evidence of that fact.

We have just passed Full Moon [what a beautiful sight it was!] and I hear Dean Martin's boozy voice crooning, "Wheeeen the moon hits your eyes like a big pizza pie..." Get ready to enjoy the hunger that phrase generated in me as a nine year old. Yes, the Annual Mi Amore ACL Pizza Party/Membership Renewal Meeting will convene at 6:00 [food served at 6:30] on the 14th at MiAmore, 1321 North H Street, Lompoc. Annual membership is a mere \$20.00 [\$25.00 comes with an official ACL mug], which mainly goes toward special events and a few small maintenance fees. Because of the relatively close quarters, please be vaccinated and wear your masks while not eating. Minimum business will be conducted; plan to dine and enjoy each other's company and to renew your membership.
HAPPY NEW YEAR!
Tom

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 7th Mercury at greatest Eastern Elongation of 19.2 degrees from the Sun. It is best to view Mercury since it will be at its highest point above the horizon in the evening sky. Look low in the western sky just after sunset.



Star party's and Events

December 4, 11th Star Party at the Observatory cancelled due to weather, Marine Layer.



Nuts!



January 2022 Moon



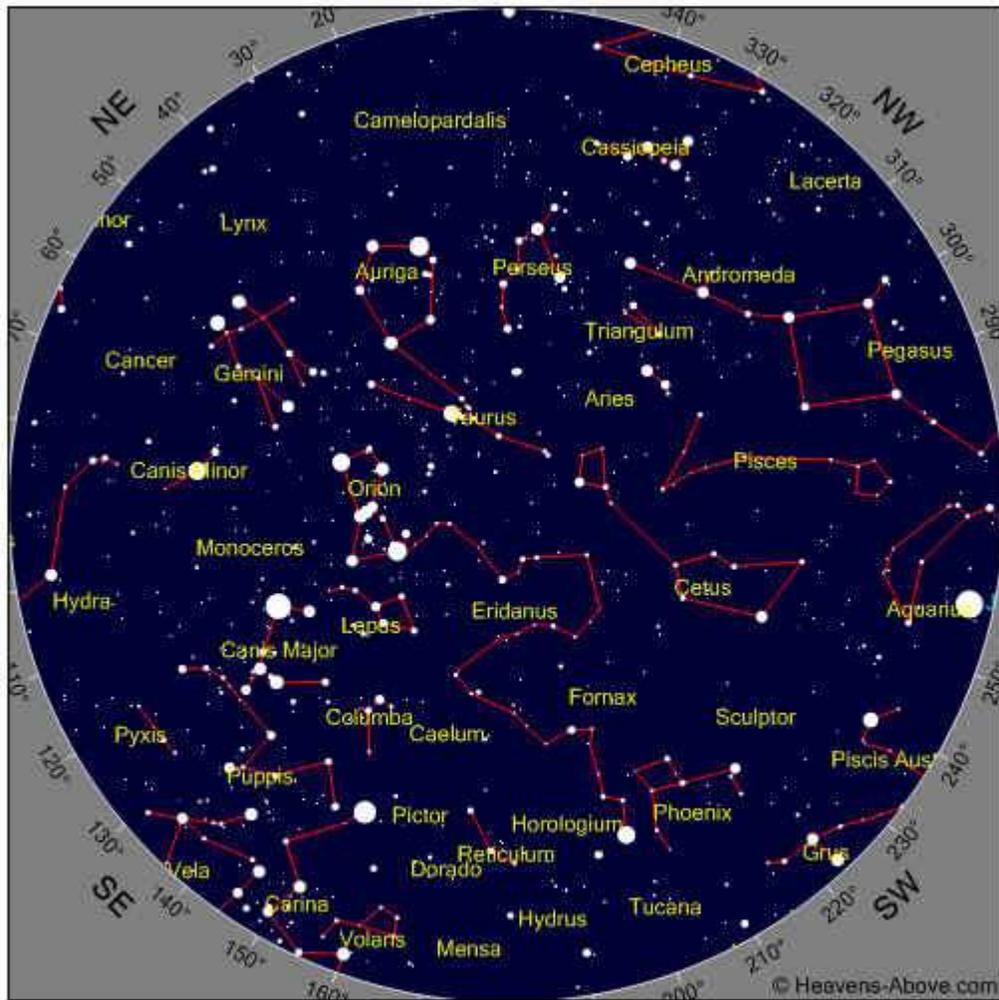
Full 17th , New 2nd , Last Quarter 25th , First Quarter 9th .

Moon Facts and folk lore

The first time you see a crescent Moon for the month, take all your spare coins out of your pocket and put them in the other pocket. This will ensure good luck for the next month.

January 2022 Sky

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



Time

Year	2022	Month	1	Day	2	Hour	21	Minute	5
------	------	-------	---	-----	---	------	----	--------	---



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.



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



President
Tom Gerald

Vice President &
Treasurer
Jana Hunking

ACL Support Personnel

ACL News letter Editor
Serf /Minion Vahan Yeterian



ACL Webmaster
Serf / Minion Aaron Anderson
(New Zealand)



Club Meeting

Reminder Club meeting January 14th 6:00 Pm
Mi Amore Pizza Lompoc.

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

