

Astronomy Club of Lompoc Presents The Sidereal Times



Trifid (see page 5)

Meeting News:

At the September ACL Club meeting we had a presentation by Bonnie on constellation stars. Vince gave a talk about the new observatory at Los Flores star party night.

Reminder: ACL club meeting October 8th 7:00 PM
Manzanita School Teachers Lounge. Wear Mask!



Lunar Calendar

New Moon 6th
Full Moon 20th



Presidents Message



Hello, Skywatchers,

Well, finally we here in Lompoc got some teaser skies, allowing some time with some planets and thanks to a glorious Moon being at peak brightness, seeing stars across the clear evenings was virtually impossible. We in this area seem to be the "Jobs of Astronomy," suffering innumerable trials. Hopefully, however, these recent treats are harbingers of clear nights coming soon, along with the colder months.

Yes, astronomy is a calling that demands much patience of the practitioner, the seasoned pro as well as the casual hobbyist. No matter what we do in this endeavor, time is required and, generally speaking, a lot of it. Even setting up and aligning a telescope takes time and energy, no matter how often you have done it. The rewards often are simply in the practice, but more is to be had, too.

Remember how we all waited for that conjunction of Jupiter and Saturn almost a year ago? We watched the dance get closer across an entire summer but we got there; even the marine layer cooperated. Now think about those people known as comet hunters, watching the skies and pouring over myriad photos and data, looking to find that elusive, faint green, but moving target. They wait months, often years to see how it will grow.

Now comes news that two such searchers have identified a comet far out in our solar system [20 AU or roughly the distance of Uranus from the sun], and it is a monster by comet terms. This one is large... very large... we're talking larger than the moons of Mars large. Going by the official designation Comet C/2014 UN271, it will be commonly called Bernardinelli-Bernstein after the two people who first tracked and reported on it, Penn graduate student Pedro Bernadinelli and astronomer Gary Bernstein. Talk about patience: Be-Be, as I am calling it, will make its closest approach ten years from now and then will still be 11 Au away, you know: where Saturn hangs out.

Molly, I may need to get a bigger scope. And patience.
Patience! Patience!
Skyward,
Tom

Events

October 2, 9, and 16 -*Star Party at the Observatory*



Yea!

October 7th Draconids Meteor Shower is a minor meteor shower producing only about 10 meteors per hour. It is produced by dust grains left behind by comet 21P Giacobini Zinner. Best viewing, in the evening. The shower peaks on the night of the 7th. Meteors will radiate from the constellation of Draco but can appear anywhere in the sky.

October 21-22 Orionids Meteor Shower is an average shower producing up to 20 meteors per hour. It is produced by dust grains left behind by comet Hally. It peaks this year on the night of the 21st and morning of the 22nd. Meteors will radiate from the constellation of Orion but can appear anywhere in the sky.

October 25th Mercury at greatest Western Elongation. The Planet Mercury reaches greatest Western Elongation of 18.4 degrees from the Sun. Look for the planet low in the Eastern sky just before sunrise.

October 29th Venus at greatest Eastern Elongation of 47 degrees from the Sun. It will be at its highest point above the Western horizon In the evening sky. Look for the planet just after sunset.

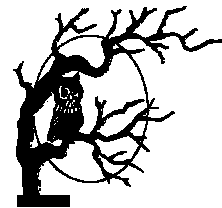


Star party's and Events

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



Nuts!



October 2021 Moon



Full 20th , New 6th , Last Quarter 28th , First Quarter 13th .

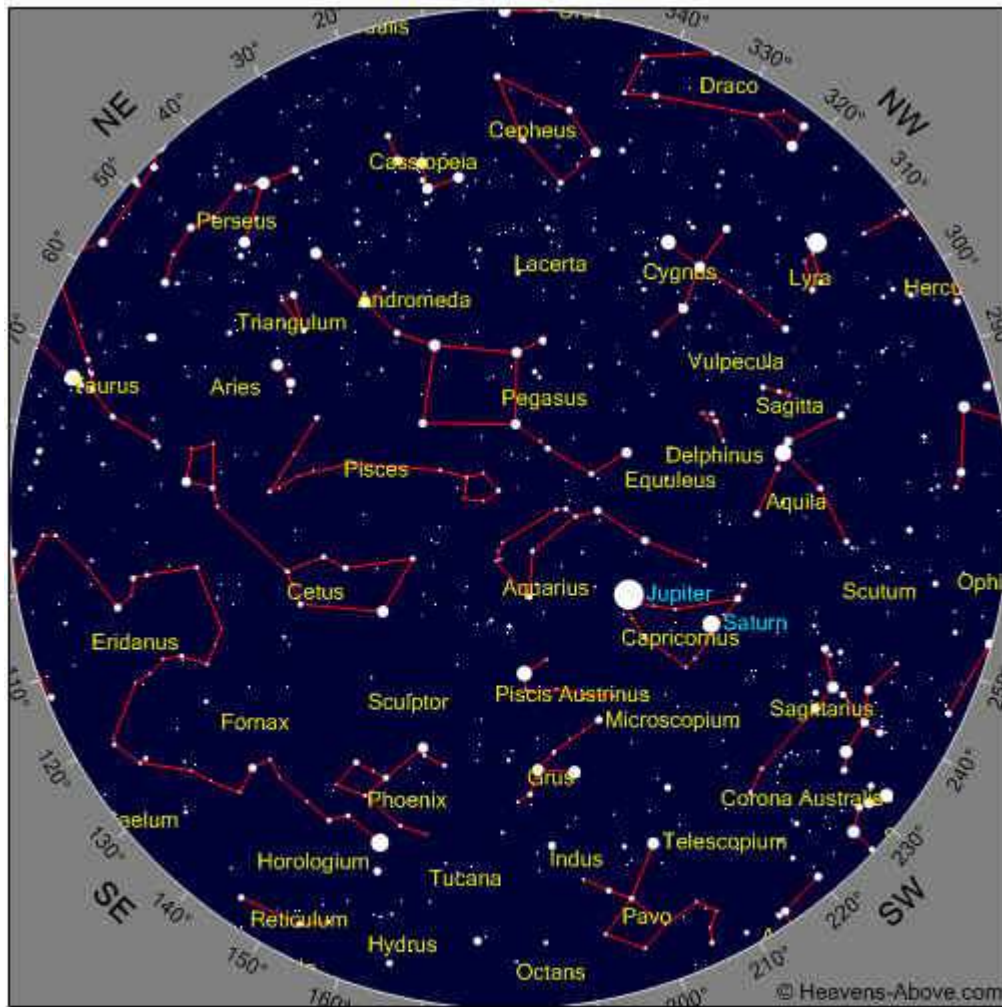
Moon Facts and folk lore

The Moon is the fifth largest natural satellite in the Solar System. At 3,475 km in diameter, the Moon is smaller than the major moons of Jupiter and Saturn. Earth is about 80 times the volume than the Moon, but both are about the same age.



October 2021 Sky

Some Objects of interest, M31, C14, Jupiter, Saturn



Time

Year	<input type="text" value="2021"/>	Month	<input type="text" value="10"/>	Day	<input type="text" value="5"/>	Hour	<input type="text" value="22"/>	Minute	<input type="text" value="10"/>
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Photo Courtesy of UNK



Messier 20 the Trifid nebula NGC 6514 is located in constellation of Sagittarius and is 5200 light years from Earth. The name means divided in to three lobes. It is an unusual combination of open cluster stars, an emission nebula, and a reflection nebula and a dark nebula that are the gaps between. The apparent gaps within the emission nebula cause the truncated appearance, it is also designated Bernard 85. The nebula is a star forming region in the Scutum spiral arm of the Milky Way. The most massive star that has formed in this region is HD164492A an O7.5III star with a mass 20 times greater than the Sun. The star is surrounded by a cluster of approximately 3100 young stars. The nebula was the subject of an investigation using the Hubble telescope using filters that isolate emission from hydrogen atoms, ionized sulfur atoms and doubly ionized oxygen atom. The combined images provided a false color composite picture suggesting how the nebula might look to the eye. The dense cloud of gas and dust is full of embryonic stars and is about 8 light years away from the nebula's central star. A jet protrudes from the head of the cloud and is about 0.75 light years long. Jets are the exhaust gasses of star formation and radiation from the nebula's central star makes the jet glow. The images also showed a finger like stalk that points directly toward the star that powers the Trifid nebula.

Image capture with C8 1280mm @ F/6.3 600mm w/PHD2 guide, Canon T3(mod) ISO 1600. 7x300s Lights/20 Darks/40 Bias/40 Flats.



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



Club Meeting

Reminder Club meeting October 8th 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)

Night Time Bright Objects (no scope required)

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/>

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

ACL Club Logo

