

Astronomy Club of Lompoc Presents The Sidereal Times



Quintet (see page 5)

Meeting News:

At the July ACL meeting we talked about supporting Astronomy Night at the Sanctuary on August 12th. A short talk on Apollo and previous space missions was given by Vahan.

Reminder: ACL club meeting Aug 11th will be held at Manzanita School Teachers Lounge 7:00 Pm.



Lunar Calendar

New Moon 16th

Full Moon 1st

This issue photographs by some club members are displayed



Presidents Message

At our July ACL meeting, with 12 attending, our newest member Jose Romero told us that he was an engineer, and as a small boy he had loved Astronomy, and taught himself about the constellations and planets, and could identify many, even from Chile where he lived for a while. Both Jose and his son, whom he wants to share his interest with the stars, are planning to go to the **Sunburst Star Party Aug. 12**. Our member Louise Gray will attend also, and they are still looking for helpers for there from our club.

I want to thank **Vahan** for his talk about the many space missions he worked upon in his career. He was involved with optics and telemetry on the Mercury, Gemini, Apollo, and Space Shuttle Missions. He enjoyed meeting several Astronauts during that time. As the discussion was turning to the future Mars Mission, Peter D. added in some interesting facts about how dangerous and long that trip to Mars would be! As my strained voice is not getting better, it would be helpful to me, for other members to do a presentation on any Astronomy subject you are interested in to share with our club. 5-10 minutes would be appreciated!

Update on our **VP Tom Gerald**- in Chelsea, Great Britian- Tom and his wife Molly are enjoying their time in England with their grandchildren. They have a lovely park close by to stroll through with many interesting plants, that have a history. Medicinal plants were grown there, and many were developed into our modern medicines. Unfortunately, the skies above him are like Lompoc.... Cloudy! Our annual Picnic, a Pot Luck, will be held on **Sept. 9th -Sat**. at the Lutheran picnic area that is at the very end of River Park in Lompoc. Place the date on your calendar! Be thinking of what dish you may want to bring to this event. Jana will give a brief talk in August on **Area 51- the Truth and Myths** of the real area in Nevada. Another brief talk would be welcome !

Hoping for warm clear nights! Jana

Events

Aug 12, 19, 26 -*Star Party at the Observatory*

Aug 1 Full Moon, the Moon will be located on the opposite side of Earth as the Sun and its face will be fully illuminated. This phase occurs at 18:33 UTC. This Full Moon was known by early native American tribes as the Sturgeon Moon because the Sturgeon were more easily caught this time of year.

Aug 10 Mercury at Greatest Eastern Elongation of 22.4° from the Sun. This is the best time to view because it will be at its highest point in the evening sky, look for it low in the western sky just after Sunset.

Aug 12, 13 Perseids Meteor Shower is one of the best meteor Showers to observe, producing up to 60 meteors per hour at its peak. It is produced by comet Swift- Tuttle. Meteors will radiate from the constellation Perseus but can appear anywhere in the sky.

Aug 27 Saturn at opposition - The ringed planet will be at its closest approach to Earth and its face will be fully illuminated. This phase occurs at 01:37 UTC. This is the best time to view or photograph Saturn and its moons.



Star party's and Events

Star Party activity this year, none due to bad weather,



August 2023 Moon



Full 1st, New 16th, Last Quarter 8th, First Quarter 24th.

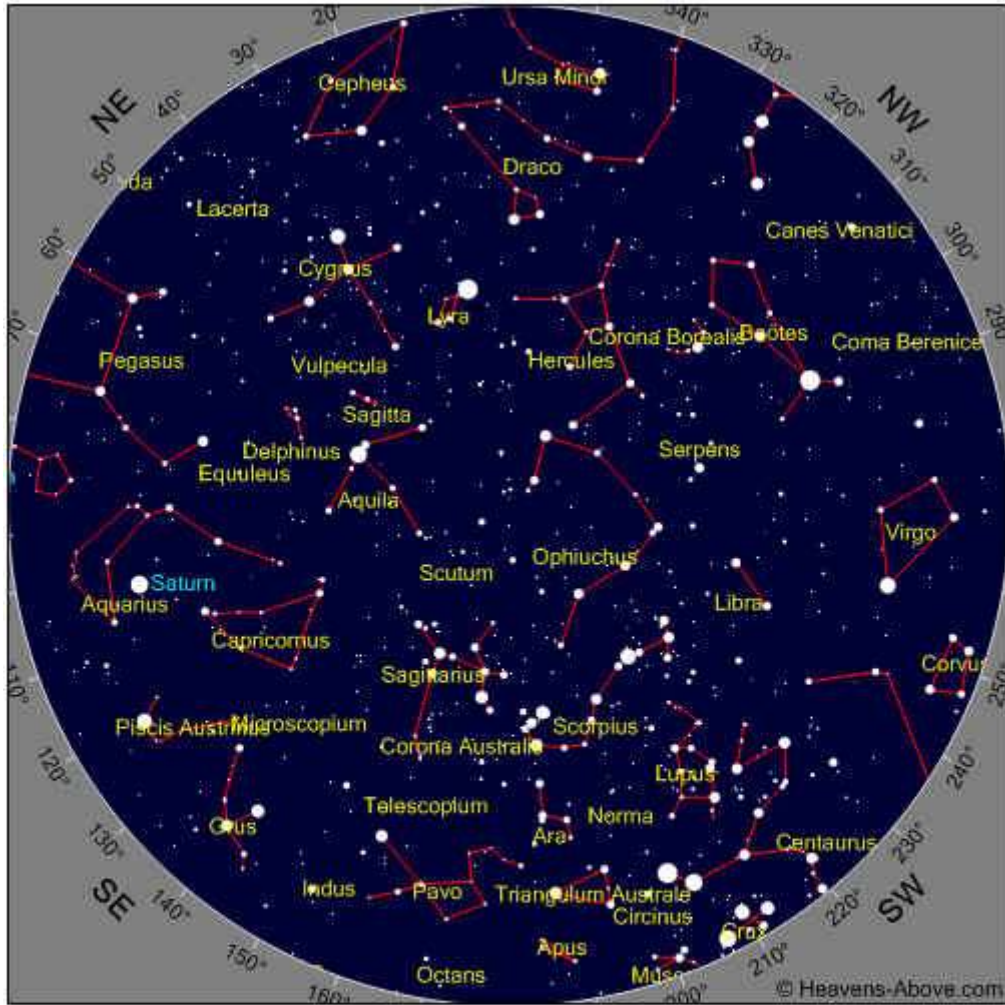
Moon Facts and folk lore

The Moon makes Earth a more livable planet by moderating our home planets wobble on its axis leading to a relatively stable climate.



August 2023 Sky

Some Objects of interest, M27, M13, Saturn



Time

Year	2023	Month	8	Day	5	Hour	21	Minute	5
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Photo Courtesy of my Friend Steve



NGC 7331, also known as Caldwell 30, is an unbarred spiral galaxy about 40 million light years away in the constellation Pegasus. It was discovered by William Herschel in 1784. NGC 7331 is the brightest galaxy in the field of a visual grouping known as the NGC 7331 group of galaxies. In fact, the other members of the group, NGC 7335, 7336, 7337 and 7340, lie far in the background at distances of approximately 300-350 million light years.

The galaxy appears similar in size and structure to the Milky Way, and is sometimes referred to as "the Milky Way's twin". However, discoveries in the 2000s regarding the structure of the Milky Way may call this similarity into doubt, particularly because the latter is now believed to be a barred spiral, compared to the unbarred status of NGC 7331. In spiral galaxies the central bulge typically co-rotates with the disk but the bulge in the galaxy NGC 7331 is rotating in the opposite direction to the rest of the disk.^[9] In both visible light and infrared photos of the NGC 7331, the core of the galaxy appears to be slightly off-center, with one side of the disk appearing to extend further away from the core than the opposite side.

Multiple supernova events have been observed in this galaxy. SN 1959D, a Type III, was the first supernova identified within NGC 7331. The supernova was discovered in a survey at Palomar Observatory. More recent supernovae are SN 2013bu and SN 2014C, the latter of which underwent an unusual "metamorphosis" from a hydrogen-poor Type Ib to a hydrogen-rich Type II over the course of a year. A 1903 photographic plate from Yerkes Observatory shows a magnitude 16.6 candidate transient that may have also been a supernova.

HCG 92, also known as **Stephan's Quintet**, is a compact group of galaxies located in the constellation Pegasus.

I imaged this group of very small galaxies from a Bortle 4 zone, and made sure to frame my shot so that a much larger object, NGC 7331 would also be visible in the final image!

Stephan's Quintet is a **visual** group of five galaxies that appear to be very close to each other. Scientists confirmed that at least four out of the five objects are so close to one another that they are interacting. These four members (HCG 92) are bound by gravity and will merge into one large galaxy in several million years.

As for the fifth galaxy visible, it only appears to be close to the group but is actually much, much closer to Earth (39 million light years) than the other four (260-340 million light years).

The full image is actually much wider (scroll further down to see it), but I had no choice but to crop it out quite a bit to be able to see the main objects due to the very small size of Stephan's Quintet.

Four of the five galaxies in this image are involved in a violent collision, which has already stripped most of the hydrogen gas from the interiors of the galaxies. The centers of the galaxies appear as bright yellow-pink knots inside a blue haze of stars, and the galaxy producing all the turmoil, NGC 7318b, is the left of two small bright regions in the middle right of the image. One galaxy, the large spiral at the bottom left of the image, is a foreground object and is not associated with the cluster.

The Spitzer spectrum showed a strong infrared signature for incredibly turbulent gas made up of hydrogen molecules. This gas is caused when atoms of hydrogen rapidly pair-up to form molecules in the wake of the shock wave. Molecular hydrogen, unlike atomic hydrogen, gives off most of its energy through vibrations that emit in the infrared.

For What its Worth

A changing Orbit The rotational period of the moon wasn't always equal to its orbit around the Earth. Just like the gravity of the moon affects ocean tides on the Earth, gravity from Earth affects the moon. But because the moon lacks an ocean Earth pulls on its crust creating a tidal bulge at the line that points toward Earth. Gravity from Earth pulls on the closest tidal bulge trying to keep it aligned. This creates tidal friction that slows the moons rotation. Over time the rotation was slowed enough that the moon's orbit and rotation matched and the same face became tidally locked forever pointed toward Earth. Just as the Earth exerts friction on the spin of the moon the moon also exerts friction on the rotation of the Earth. As such the length of day increases a few milliseconds every century. Here's how it works. The moon causes tides in the ocean. The moon's gravity pulls on the Earth and it pulls more strongly on the face of the Earth that is facing the moon. The land on the Earth does not particularly care about this extra tug but the oceans do. Water is lifted towards the moon and flows to make a bulge that faces the moon. (There is a bulge in back of the Earth too pointing away that is related). As the Earth turns this bulge flows through the oceans always approximately facing the moon, we see it as tides moving up and down. The Earth does the same thing to the moon – tidal forces from Earth are about 80 times stronger than the moon's tidal forces on Earth, because Earth's mass is greater, however there are no oceans on the moon so no liquid sloshes around like it does on Earth. The Earth's tidal force deforms the moon itself though ever so slightly. Back when the moon used to rotate relative to us there was a little land bulge on the moon's surface that wants to face Earth. When the moon used to rotate the rotation would carry the bulge with it. This set up a tug of war, the moon's rotation pulls the bulge away and the Earth pulls back on the bulge against the rotation. This then basically acted like a bicycle brake. The Earth's tidal forces constantly acted to pull against the rotation slowing the rotation down until it stopped. So now the bulge points directly at Earth, it is not very big but it is still there. A way to visualize why we see only one side of the moon is to walk in a circle while always facing the middle of the circle. While it may not feel like it, you are actually rotating your body while revolving around the circle. When you have walked halfway around the circle you face the exact opposite direction compared to when you started. You complete ½ revolution in ½ rotation, meaning the same rate of revolution and rotation. RECAP You are probably wondering why it takes the same amount of time for the moon to complete one revolution around the Earth as it does to complete one rotation around its axis. This is a phenomenon known as Tidal Locking. The force of Earth's gravity pulling on the moon causes it to bulge slightly in the direction of the Earth. Imagine that the rotation of the moon about its axis were faster or slower than its orbit around the Earth. Because the force of gravity is inversely proportional to the square of the distance between the two bodies ($F=GMm/r^2$, where M and m are the masses of the 2 objects, G is the gravitational constant, and r is the distance between the 2 objects). The force on the bulge closer to the Earth is greater than the force on the bulge farther from the Earth. Thus the force of Earth's gravity pulling on the bulge would produce a torque (force that causes rotation) on the moon causing the moon's rotation to slow down until the period (amount of time to complete one cycle) of rotation of the moon about its axis and the orbit of the moon around the Earth are the same. Moon Statistics Distance from Earth – 238,857 miles (Average), 384,400 Km (Average) Size – 2,260 miles in diameter, about 27% of Earth (3,475 Km). Gravity – 17% Earth Gravity. Orbital Period – 29.5 days Length of Day – 708 hours. Travel time - By Apollo 11 = 3 days. If you could drive it by car 135 days at 70 mph (113 Km/hr).



Astronomy Club Officers



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Tom Gerald



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ACL News letter Editor
Serf / Minion Yahan Yeterian



ACL Webmaster
Serf / Minion Aaron Anderson
(New Zealand)



Club Meeting

Reminder Club meeting Aug 11th 7:00 Pm
Manzanita School Teachers lounge.

Star Parties (as always weather permitting)

Other Astronomy club meetings and links to sites.

<http://www.centralcoastastronomy.org/>

[Astronomy Club of Lompoc \(ACL\) \(universeii.com\)](http://www.universeii.com)

[Sunrise and sunset times in Lompoc \(timeanddate.com\)](http://www.timeanddate.com)

[Moonrise, Moonset, and Moon Phase in Lompoc \(timeanddate.com\)](http://www.timeanddate.com)

[http:// www.sbau.org/#AU EVENTS Calendar](http://www.sbau.org/#AU_EVENTS)

[http:// www.heavens-above.com/](http://www.heavens-above.com/)

<https://spaceweather.com>

<https://www.space.com>

<https://skymaps.com>

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

ACL Club Logo

