

Astronomy Club of Lompoc Presents The Sidereal Times



Caldwell 49 (see page 5)

Meeting News At the June Zoom video club meeting we talked about our outreach for Manzanita School students at the Observatory 27 May. Also our annual club picnic to be held at River Park on the 24th of July.

Reminder: ACL club meeting Friday July 9th at the Manzanita School Teachers Lounge 7:00 PM. Wear your masks.



Lunar Calendar:

New Moon 10th
Full Moon 24th

Manzanita school Outreach May 27th 2021



Presidents Message

Hello, Members and Supporters of ACL.
So here's the deal, restrictions have been lifted to the point at which our July 9th meeting will be held IN PERSON around the table of the Teacher's lounge of Manzanita Elementary School! Finally, we are actually there! A caveat however, and one only: all though to the best of our knowledge we are all vaccinated, we will wear masks out of precaution and care for each other's health. It will be wonderful to gather again together and see each other full size and in vivid 3-D reality! One of the main items of discussion will be our...shall we say... Solar Celebration Picnic! Yes we usually have our annual gathering in October, but after waiting so long we are delaying not a month more! The picnic this year will be held at River Park in the shade of the Pavilion at the farthest end of the park near the Viet Nam War Memorial. This being an outdoor event masks will be optional and by all means off for eating. The BBQ Tri-tip and garlic bread is, as usual, supplied by the club treasury. Likely we will have telescopes on hand at the picnic and, given the bang up way solar cycle 25 is proceeding there should be one or more Sunspots to observe. Because of the persistent nightly June Gloom sunspots at least give us target for our scopes during the day. Hopefully we will have that wonderful Hancock H Alpha scope on hand with which we will be able to spot prominences looming above the Sun's surface.

So, July is shaping up to be a happy month for ACL and I for one am looking forward to seeing all of you at these two events. Until then keep looking skyward.

Tom

Duh ACL BBQ Guy



Events

July 4th Mercury at greatest Western Elongation of 21.6 degrees from the Sun. This is the best time to observe Mercury. Look for the planet low in the Eastern sky just before sunrise.

July 24th ACL annual picnic to be held at River Park 12:00 Noon. Bring a plate with something to share with the membership. BBQ Tri-Tip and Garlic Bread supplied by the club treasury.

July 28th Delta Aquarids Meteor Shower is an average shower that can produce up to 20 meteors per hour at its peak. It is produced by debris left behind by comets Marsden and Kracht. The shower runs annually and peaks this year on the night of July 28th and the morning of the 29th. Meteors will radiate from the constellation of Aquarius but can appear anywhere in the sky.

July 3rd 10th 17th *Star Party at the Observatory cancelled due to Covid-19 virus.*



Nuts!



Star party's and Events

June 5th, 12th, 19th Star Party at the Observatory cancelled due To Covid-19 virus.



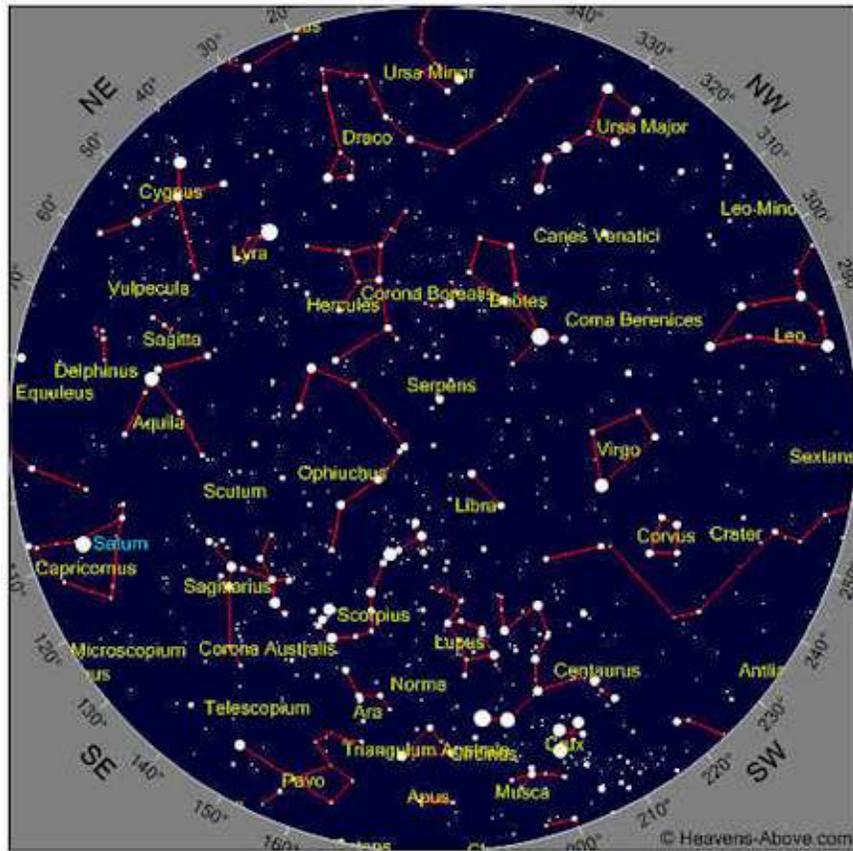
Nuts!







July Sky 2021



Time

Year	2021	Month	7	Day	2	Hour	21	Minute	5
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July Moon 2021



Full 24th , New 10th , Last Quarter 1st , First Quarter 17th

Moon Facts and Folklore

As you read this, the Moon is moving away from us. Each year the Moon steals some of Earth's rotational energy and uses it to propel itself about 3.8 centimeters higher in its orbit. Researchers say that when it formed the Moon was about 14,000 miles from Earth. It is now more than 240,000 miles away. The Moon is Earth's only natural satellite, Right? Maybe not. In 1999 scientists found that a 3 mile wide asteroid may be caught in Earth's gravitational grip thereby becoming a satellite of our planet.

Photo Courtesy David McNally



The Rosette nebula Caldwell 49 NGC 2237 located near one end of the giant molecular cloud in the Monoceros region of the Milky Way Galaxy. The open cluster NGC 2244 is closely associated with the nebulosity, the stars of the cluster having been formed from the nebula's matter. The cluster and nebula lie at a distance of some 5000 light years from Earth and measure roughly 50 light years in diameter. The radiation from the young stars excites the atoms in the nebula causing them to emit radiation themselves producing the emission nebula we see. The mass of the nebula is estimated to be around 10,000 solar masses. A survey of the nebula with the Chandra X-ray observatory has revealed the presence of numerous new born stars inside the optical Rosette nebula studded with a dense molecular cloud. Altogether, approximately 2500 young stars lie in this star forming complex. This includes the massive O-type stars HD46223 and HD46150 which is responsible for blowing the ionized bubble. Most of the on going star-formation is occurring in the dense molecular cloud to the South East of the bubble. A diffuse X-ray glow is also seen between the stars in the bubble. This has been attributed to super hot plasma with temperatures ranging from 1 to 10,000,000 degrees K. This is significantly hotter than the 10,000 K plasmas seen in the H ii regions and is likely attributed to shock-heated winds from the massive O-type stars. Image capture, 400 mm telephoto lens, Canon T3i Baader modified, Celestron CGEM hypertuned mount, frames 20 x 120" and integration time 0.7 hours, image processing software DSS 3.3.4.

For What its Worth

The Sun and its atmosphere are divided into several zones and layers. The solar interior, from inside out, is made up of the core, Radiative zone and Convective zone. The solar atmosphere above that consists of the Photosphere, Chromosphere, a transition region and the Corona. Beyond that is the solar wind, an outflow of gas from the corona. The core extends from the Sun's center to about a quarter of the way to its surface. Although it only makes up roughly 2 percent of the Sun's volume it is almost 15 times the density of lead and holds nearly half of the Sun's mass. Next is the Radiative zone that extends from the core to 70 percent of the way to the Sun's surface, making up 32 percent of the Sun's volume and 48 percent of its mass. Light from the core gets scattered in this zone so that a single photon may take a million years to pass through. The Convection zone reaches up to the Sun's surface and makes up 66 percent of the Sun's volume but only a little more than 2 percent of its mass, roiling convection cells of gas, dominate this zone. Two main kinds of solar Convection cells exist – Granulation cells about 600 miles (1,000 kilometers) wide and Super-Granulation cells about 20,000 miles (30,000 kilometers) in diameter. The Photosphere is the lowest layer of the Sun's atmosphere and emits the light we see. It is about 300 miles (500 Km) thick, although most of the light comes from its lowest third. Temperatures in the photosphere range from 11,000° F at the bottom to 7,460° F at the top. Next up is the Chromosphere, which is hotter, up to 35,500° F and is apparently made up entirely of spiky structures known as Spicules typically some 600 miles across and up to 6,000 miles high. After that is the Transition region a few hundred to a few thousand miles thick. It is heated by the corona above it and sheds most of its light as ultraviolet rays. At the top is the super-hot corona are structures such as loops and streams of ionized gas. The Corona generally ranges from 900,000° F to 10.8 million° F and can even reach tens of millions of degrees when a solar flare occurs. Matter from the Corona is blown off as the solar wind. Just like most other stars the Sun is made up of mostly hydrogen and helium. Nearly all remaining matter consists of seven other elements, oxygen, carbon, neon, nitrogen, magnesium, iron and silicon. For each million atoms of hydrogen in the Sun there are 98,000 of helium, 8 oxygen, 360 of carbon, 120 of neon, 110 of nitrogen, 40 of magnesium and 35 of silicon. Still hydrogen is the lightest of all elements and accounts for 72 percent of the Sun's mass, while helium is about 26 percent. The strength of the Sun's magnetic field is only about twice as strong as Earth's field. However it becomes highly concentrated in small areas reaching up to 3000 times stronger than usual. These kinks and twists in the magnetic field develop because the Sun spins more rapidly at the equator than at higher latitudes and because the inner parts of the Sun rotate more quickly than at the surface. These distortions create features like Sun Spots to eruptions known as flares and Coronal Mass Ejections. Flares are the most violent eruptions in the solar system while Coronal Mass Ejections are less violent but involve extraordinary amounts of matter, a single eruption can spout roughly 20 billion tons of matter into space. Sun Spots are relatively cool dark features on the Sun's surface that are roughly circular. They emerge where dense bundles of magnetic field lines from the Sun's interior break through the surface. The number of Sun Spots vary as solar magnetic activity does. The change in this number from a minimum of none to a maximum of roughly 250 Sun Spots or clusters of Sun Spots is known as the solar cycle and averages about 11 years long. At the end of the cycle the magnetic field rapidly changes polarity. The Sun has enough nuclear fuel to stay much as it is now for another 5 billion years. After that it will swell to become a red giant. Eventually it will shed its outer layers and the remaining core will collapse and become a white dwarf. Slowly this will fade to enter its final phase as a dim, cool theoretical object sometimes known as a black dwarf.

Astronomy Club Officers



**President
Tom Gerald**

**Vice President &
Treasurer
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ACL Support Personnel

*ACL News letter Editor
Serf / Minion Vahan Yeterian*



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



Club Meeting

Reminder ACL Club meeting Friday July 9th at the Manzanita School Teachers Lounge 7:00 PM. Wear your masks.

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)

Link to "Heavens Above" web site

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

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

ACL Club Logo

