

Astronomy Club of Lompoc Presents The Sidereal Times



M30 Cluster (see page 5)

Meeting News:

At the May ACL meeting we had general discussions on future events where we will be working with the schools 3rd and 4th grade classes. Also there was presentation about Tides by Vahan.

Reminder: ACL club meeting June 9th will be held at Manzanita School Teachers Lounge 7:00 Pm. Masks!



Lunar Calendar

New Moon 18th

Full Moon 4th

This issue Club meetings and Outings



Presidents Message

Vahan gave a thought-provoking explanation about how our ocean tides seem to go “in and out with high and low tides.” He showed us on posters that he had drawn up, how tides are produced by the effect of gravity of the Sun and Moon on the Earth and Earths rotaton.

Steve Ball handed out a flyer called Measuring Tip: You are the Ruler! That will be very helpful to anyone who is wanting to see for themselves or explain to someone else, how to point out a far distant object in the sky, using your hand and fingers in a way to measure the degrees in the sky. He has extra copies, if you are interested.

If the skies are clear on **Monday, June 22**, one can view the Jupiter, Mercury, Venus, & Mars in alignment in the western sky. Best view will just be after sunset when it is dark enough. The 3rd quarter waxing crescent Moon will appear near Venus also Good Luck!

You may have heard about the small 4x6 inch (2.2lb) **Meteorite** that crashed through the roof of a home in New Jersey on May 8, 2023. When the lady in the home discovered what put a hole in the roof and a dent in her floor, she picked up the still warm traveler from space. Scientists have determined it was a stony Chondrite Meteorite that was 4.6 billion years old! What an exciting gift from our heavens!

I am about to journey on a trip with friends to B.C., Canada by plane, train, and bus for 10 days near the end of May. It would be so exciting to see any Northern Lights there due to our high solar activity this year.

The main topic Presentation for June, by Jana -will be on **Female Astronauts-** featuring **Sally Ride** and her achievements.

Hoping for Clear Skies! Jana

Events

June 10, 17, 24 -*Star Party at the Observatory*

June 1&2 Mars in the Beehive, the planet will pass through the Beehive cluster of stars located in the constellation of Cancer.

June 4th Venus at Greatest Eastern Elongation of 45.4° from the Sun. This is the best time to view Venus since it will be at its highest point above the horizon in the evening sky. Look for the planet in the Western sky after sunset.

June 12 & 13 Venus in the Beehive. The planet Venus will pass through the Beehive open cluster located in the constellation of Cancer.

June 21st June Solstice occurs at 14:51 UTC. The North pole of the Earth will be tilted toward the Sun which will have reached its northern most position in the sky and will be directly over the tropic of Cancer at 23.44° north latitude. This is the first day of summer (summer solstice) in the northern hemisphere and the first day of winter (winter solstice) in the southern hemisphere.

June 22nd Jupiter, Mercury, Venus, & Mars in alignment in the western sky. Best view will just be after sunset when it is dark enough. The 3rd quarter waxing crescent Moon will also appear near Venus.



Star party's and Events



June 2023 Moon



Full 4th, New 18th, Last Quarter 10th, First Quarter 26th .

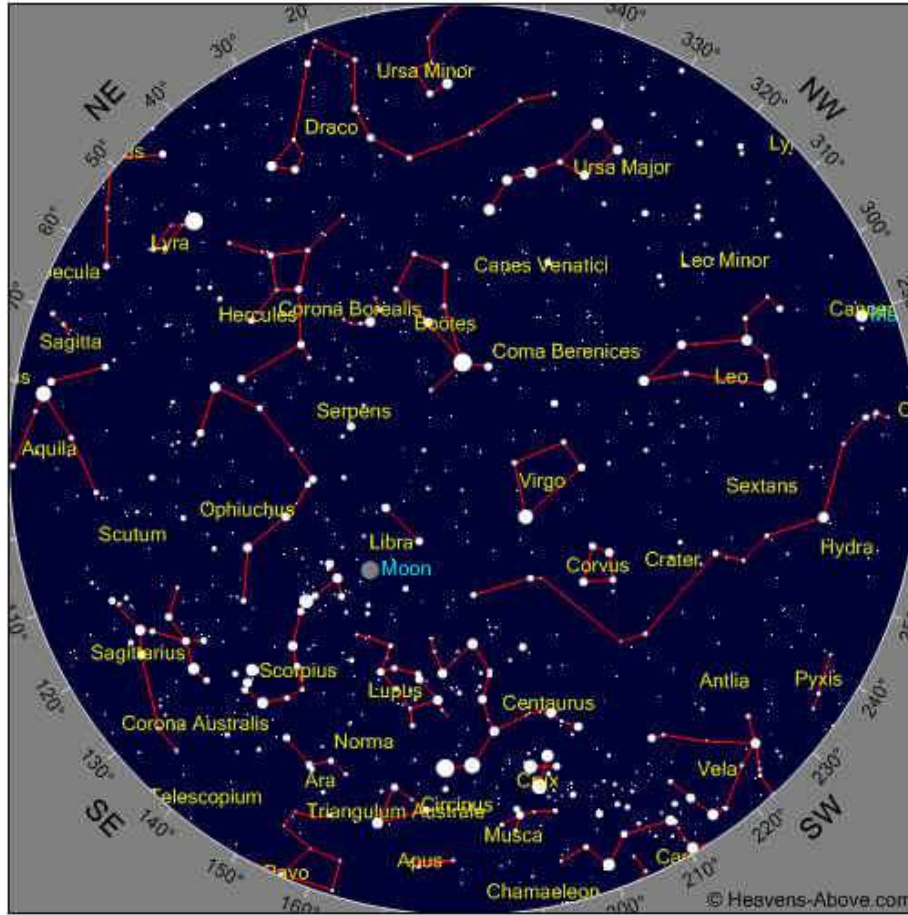
Moon Facts and folk lore

Long ago, the Earth's gravitational effects slowed the moon's rotation about its axis. Once the moon's rotation slowed enough to match its orbital period (the time it takes the moon to go around Earth) the effect stabilized. Many of the moons around other planets behave similarly.



June 2023 Sky

Some Objects of interest, M13, Moon



Time

Year	2023	Month	6	Day	2	Hour	21	Minute	30
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Photo Courtesy of John Walke



Messier 30 globular cluster is about 26,000 light years distant and is located in the constellation of Capricornus. It follows a retrograde orbit through the galactic halo that suggests that M30 was acquired from a satellite galaxy rather than forming in the Milky Way galaxy. It is 180,000 times the mass of the Sun. It has an angular diameter of 12 arc minutes corresponding to 90 light years. It is a fairly dense cluster and contains a bright red giant star about 12.1 magnitude. The cluster is approaching at approximately 181.9 Km/sec. The core of the cluster exhibits an extremely dense population and has undergone core collapse similar to at least 21 other of the 157 globular clusters in the Milky Way galaxy also including M15, M70, M62 and M79. Consequently M30 core is very small in extension about 12 arc minutes. Despite its compressed core, close encounters of the member stars of M30 have rarely occurred. Image capture was with a C8, 1280mm @f/6.3 600mm w/PHD2 guide. T3 (mod) ISO 1600, 12 x 300 lights, 20 darks, 40 bias/60 flats.



For What its Worth

White Holes, A white hole is a hypothetical feature of the universe. It is considered the opposite of a black hole. As black holes don't let anything escape from their surface, white holes are eruptions of matter and energy and nothing can get inside of them. White holes are a possible solution to the laws of General Relativity. This law implies that if eternal black holes exist in the universe then a white hole should also exist. It is a time-reversal of a black hole. They are expected to have gravity, so they attract objects, but anything on a collision course with a white hole would never reach it. Theoretically, if you were to approach a white hole in a spacecraft you would be inundated by a colossal amount of energy that would most likely destroy your ship. Even if your ship could withstand gamma rays, light itself would start slowing you down like air resistance slowing down a moving vehicle on Earth. Even if the spaceship is built to be unaffected by the energy emission, space and time would be weirdly warped around a white hole; approaching a white hole would be like going uphill. The acceleration required would get higher and higher while you move less and less. There isn't enough energy in the universe to get you inside. Of course this is counterintuitive. How could energy in a white hole seemingly come from nowhere other than space time itself. This is one reason why their existence is very unlikely. However, there are some theories in which white holes are possible but perhaps not quite as described in general relativity. As they are alleged counterparts of black holes, white holes too would be formed by a gravitational singularity. A singularity is a point like feature in space-time where the gravitational field becomes infinite. Infinite values in physics are usually an indication of missing pieces in a theory, so it is not surprising that quantum mechanics and relativity struggle to explain the finer details of singularities. Potential candidates A lot of phenomena have been put forward as white holes. They are usually chosen because they are mysterious objects that we have not been able to explain in detail. Gamma ray bursts, fast-spinning pulsars and black holes reaching the end of their lives have all been considered. Even the big bang has been described as a white hole, but so far no white holes have ever been directly observed, and even their theoretical existence raises some red flags. It seems like white holes are used as a place mark until more observations or better theory come along. The big bang as a white hole is a clear example of this trend. Until we were uncertain about the size of the universe, there was speculation that the cosmos was produced by a white hole larger than we could see. We now know that the universe is most likely infinite which makes the whole explanation almost certainly wrong. Theoretical Constraints A white hole is a particular kind of singularity; a naked singularity. Singularities like black holes cannot be directly observed because the escape velocity (the speed you need to break free of its gravity) is greater than the speed of light, so nothing can escape from it. The singularity is protected by an event horizon, the surface that separates us from the black hole. Mathematically when we have a singularity space-time is broken. To avoid this issue, event horizons were introduced. A naked singularity has no event horizon. Accordingly to the fundamental principals of general relativity the universe doesn't allow singularities. The idea is aptly called the cosmic censorship hypothesis. Numerical simulations and the current theories of quantum gravity hint at the possibility of naked singularities. A curious phenomenon happens in describing a black holes properties with a quantum mechanical approach which doesn't include gravity. If you look at a black hole backward or forward in time, it behaves exactly the same way and remains a black hole. This not the most important clash between quantum theories and relativity, but is significant nevertheless. The most important constraint is entropy, the measure of the order of the system. According to the laws of thermodynamics the net entropy of the universe is always increasing. Entropy could decrease locally; for example a freezer decreases the entropy of water by turning it into ice, but the freezer engines emit a lot of heat so the total entropy is still increasing. White holes decrease entropy which is a fundamental piece of evidence against them in this universe. We obey the laws of thermodynamics and so far no confirmed violations have been observed, although we often hear claims of perpetual motion machines and unusual events. Future of White holes White holes fascinate a lot of people and they give us a sense of balance. People will and should continue to study them. Several features of general relativity, black holes for example, were first considered a theoretical curiosity. There is no hard evidence proving that white holes exist. But maybe in our vast complicated universe, there is space for even them. Just a thought; could it be that when Black holes die they could become white holes?

Astronomy Club Officers



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Club Meeting

Reminder Club meeting June 9th 7:00 Pm
Manzanita School Teachers lounge. Masks!
Star Parties (as always weather permitting)

Other Astronomy Club Meetings and links to other sites.

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

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

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

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

<https://spaceweather.com>

<https://www.space.com>

<http://spacemaps.com>

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



ACL Club Logo

