Website: https://acl.universeii.com February 2, 2022


Hubble Pillars (see page 5)

Meeting *News:*

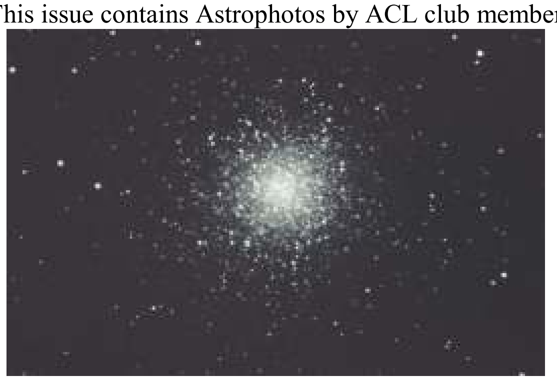
At the January ACL Club meeting we cancelled New Years Pizza Party at Mi Amore Pizza. Due to Covid situation.

Reminder: **ACL club meeting February 9th 7:00 PM On Zoom net.**

Lunar Calendar

New Moon 1st
Full Moon 16th

This issue contains Astrophotos by ACL club members.



Presidents Message

Hello, Fellow Astronomy Fans,

What a month January was! May it stay behind us and never come again in the form it brought our little group. First there was the necessity of postponing our annual Pizza Party. Then Lompoc's Elder Statesman of Astronomy, Vahan, had surgery that proved to be no walk in the park. Then, clouds returned to muck up our nights. But we persevered: our hastily arranged Zoom meeting on the 14th filled in for the party quite well as the half dozen members gathered freely exchanged stories and news of interest to the club.

As to the Annual Pizza Party postponement, we plan to host it in April, when conditions should allow us to meet in a public setting. Remember that the party actually celebrates January as membership renewal month. If you have not turned in your dues, yet, please send your check for $20.00 to our Vice President and Treasurer Jana Hunking at 324 North Lupine Street, Lompoc, CA 93436

I do want to call attention to our Facebook page. Joel created the banner for it and I plugged that in a few months ago. I have been adding news items that catch my attention, feeling my way, making an active presence for our club; Vahan furnished me with some of his astrophotographs to share. If you have a Facebook page let me know and I will invite you to follow the page. Any photos you have taken and would like to share would be appreciated; you can email them to me if you do not have a Facebook account. Beginning February 18th through March 3rd, because of a lack of moonlight, we have an excellent opportunity to view the Zodiacal Light. Get well out of town, to the darkest sky you can find around here, somewhere with a clear view to the western horizon. After sunset you may well see the faint arc of light that is sunlight reflected off interplanetary dust in our solar system. Long thought to be particles let from comets and colliding asteroids, recent research involving the Juno spacecraft suggests this dust comes from Mars. Happy hunting, friends!

Skyward,

Tom

Events

February 6, 13 and 20 ***Star Party at the Observatory***


Yea!

February 16th Mercury at greatest Western Elongation. The Planet Mercury reaches greatest Western Elongation of 26.3 degrees from the Sun. Look for the planet low in the Eastern sky just before sunrise.

Star party's and Events

January 9, 16, & 23 Star Party at the Observatory Cancelled.


Nuts!

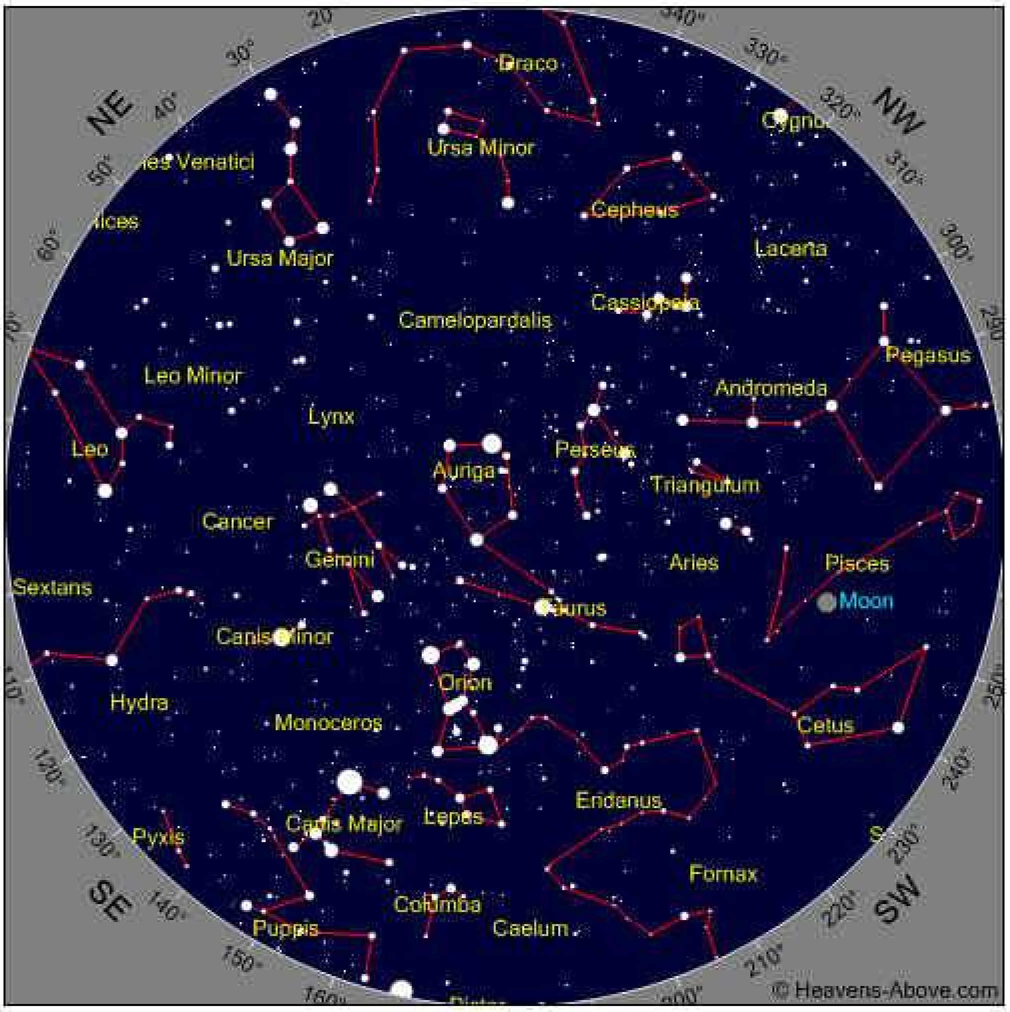
February 2022 Moon

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 (2160 miles) 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.

February 2022 Sky
Some Objects of interest, M42, M 1, M31



Time

Year 2022 Month 2 Day 5 Hour 20 Minute 0

Photo Courtesy of Hubble Telescope

The Pillars of Creation, one of the most iconic and popular images located Messier 16, NGC 6511, the Eagle Nebula. It is a star forming nebula located in the constellation of Serpens. It occupies an area of 70 to 55 light years (30 arc minutes of sky). This image is seen in visible light capturing the multi-colored glow of gas clouds, wispy tendrils of dark cosmic dust, and the rust colored elephants trunks of the nebulas famous pillars. The blue colors represent oxygen, red is sulphur and green is nitrogen and hydrogen, The dust and gas in the pillars is scared by the intense radiation from young stars and eroded by strong winds from massive nearby stars. With these new images comes a better contrast and clearer view for astronomers to study the structures of the pillars. The pillars are 6500 t0 7000 light years distant. The name is base on a phrase in a sermon, “The Condescension of Christ”. The pillars are composed of cool molecular hydrogen and dust that are being eroded by photo evaporation from the ultra violet light from relative close hot stars. The left most pillar is about 4 light years in length. The finger like protrusions at the top of the clouds are larger than our solar system and are made visible by shadows of evaporating gaseous globules (EGGs) that shield the gas behind them from the intense UV flux. EGGs are themselves incubators of new stars. These stars emerge from the EGGs and are then evaporated.

For What its Worth

The James Webb Space Telescope will not be in orbit around the Earth, like the Hubble Space Telescope is - it will actually orbit the Sun, 1.5 million kilometers (1 million miles) away from the Earth at what is called the second Lagrange point or L2. What is special about this orbit is that it lets the telescope stay in line with the Earth as it moves around the Sun. This allows the satellite's large sunshield to protect the telescope from the light and heat of the Sun and Earth (and Moon).

Webb primarily observes infrared light, which can sometimes be felt as heat. Because the telescope will be observing the very faint infrared signals of very distant objects, it needs to be shielded from any bright, hot sources. This also includes the satellite itself! The sunshield serves to separate the sensitive mirrors and instruments from not only the Sun and Earth/Moon, but also the spacecraft bus.
The telescope itself will be operating at about 225 degrees below zero Celsius (minus 370 Fahrenheit). The temperature difference between the hot and cold sides of the telescope is huge - you could almost boil water on the hot side, and freeze nitrogen on the cold side! To have the sunshield be effective protection (it gives the telescope the equivalent of SPF one million sunscreen) against the light and heat of the Sun/Earth/Moon, these bodies all have to be located in the same direction. This is why the telescope will be out at the second Lagrange point. Joseph-Louis Lagrange was an 18th century mathematician who found the solution to what is called the “three-body problem.” That is, is there any stable configuration, in which three bodies could orbit each other, yet stay in the same position relative to each other? As it turns out, there are five solutions to this problem - and they are called the five Lagrange points, after their discoverer. At Lagrange points, the gravitational pull of two large masses precisely equals the centripetal force required for a small object to move with them. The L1, L2, and L3 points are all in line with each other. It is easy for an object (like a spacecraft) at one of these five points to stay in place relative to the other two bodies (e.g., the Sun and the Earth). In fact, L4 and L5 are stable in that objects there will orbit L4 and L5 with no assistance. Some small asteroids are known to be orbiting the Sun-Earth L4 and L5 points. However, L1, L2, and L3 are metastable so objects around these points slowly drift away into their own orbits around the Sun unless they maintain their positions, for example by using small periodic rocket thrust. This is why L1, L2, and L3 don't "collect" objects like L4 and L5 do. What are "Lagrange points", also known as "libration points" or "L-points"? These are all jargon for places where a light third body can sit "motionless” relative to two heavier bodies that are orbiting each other thanks to the force of gravity.

Webb's position out at L2 also makes it easy for us to talk to it. Since it will always be at the same location relative to Earth-in the midnight sky about 1.5 million km away - we can have continuous communications with it as the Earth rotates through the Deep Space Network (DSN), using three large antennas on the ground located in Australia, Spain and California. During routine operations, Webb will uplink command sequences and downlink data up to twice per day, through the DSN. The observatory can perform a sequence of commands (pointing and observations) autonomously. Typically, the Space Telescope Science Institute will upload a full week's worth of commands at a time, and make updates daily as needed. If Webb is orbiting the Sun further out than Earth, shouldn't it take more than a year to orbit the Sun? Normally yes, but the balance of the combined gravitational pull of the Sun and the Earth at the L2 point means that Webb will keep up with the Earth as it goes around the Sun. The gravitational forces of the Sun and the Earth can nearly hold a spacecraft at this point, so that it takes relatively little rocket thrust to keep the spacecraft in orbit around L2. And Webb will orbit around L2, not sit stationary precisely at L2. Webb's orbit is actually similar in size to the Moon's orbit around the Earth! This orbit (which takes Webb about 6 months to complete once) keeps the telescope out of the shadows of both the Earth and Moon. Unlike Hubble, which goes in and out of Earth shadow every 90 minutes, Webb will have an unimpeded view that will allow science operations 24/7.

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“Science operations!” Webb will begin its science mission and start to conduct routine science operations approximately 6 months after arriving at L2

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 February 9th 7:00 Pm.
On Zoom.

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

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