Website: http://acl.universeii.com February 2, 2020

Astronomy Club of Lompoc
Presents
The Sidereal Times

Sun Spots (see page 5)

Meeting *News:*

At the January meeting and New Year party we discussed the club Logo, renewing membership and presentations by club members at monthly meetings.

Reminder: ACL club meeting February 14th 7:00 pm Manzanita School Teachers Lounge.

Lunar Calendar

New Moon 23rd
Full Moon 9th

New Year party 2020

Presidents Message

Hello, Fellow Stargazers:

Well, reports that I have received say that our Membership Renewal Party at Floriano's was a delicious success! Thank you to all of you who turned out for the food and fun in what I hear was a welcoming and quiet space. Quiet... I was so happy to hear about that! We may have found a new home for our annual gathering? A special vote of thanks to all of you who renewed your memberships. You covered the expenses of the evening and helped fund the picnic next fall.

I was away at that time, in Fort Collins, CO, on family business. One of the highlights of that trip came from my five-year-old grandson, Arlo. As he got out of the car one evening after school, he rushed up to me, pointing to the western sky, excitedly asking, "Is that Venus?" Indeed, it was blazing away in the fading pink light. He went on to name all the planets, in order from the sun. Bedtime, he pulled out one of his favorite books on space and rockets, and the fun continued. His twin sister, Piper, shares his interest, but right now is a tad more focused on unicorns and faeries, so stayed out of this particular discussion.

2020 is a special year for our organization: it marks our thirty-fifth year of sharing in the joys of astronomy! This is a pretty remarkable record and we can be very proud of our part in keeping the story developing. I am open to suggestions of how we should properly celebrate this hallmark in the coming months. We should arrange press coverage, naturally, and consider some form of community celebration. I look forward to discussing possibilities with you at our upcoming meeting on the 14th. I know some of you will have other plans for this particular evening, being Valentine's Day and all. But, for those who do show up, we WILL have chocolate. See you there!

Skyward,
Tom

Events

February 1st ***Star Party at the Observatory.*** .
Yea!

February 9th Full Moon Super Moon. The Moon will be located on The opposite side of Earth and its face will be fully illuminated. This Phase occurs at 07:34 UTC. This Moon was known by early native American tribes as the Full Snow Moon because the heaviest snows usually fell this time of year. The Moon will be at its closest approach to the Earth and may look larger and brighter than usual.

February 10th Mercury at greatest eastern elongation of 18.2 degrees from the Sun. This is the best time to observe Mercury Because it will be at its highest point in the evening sky. Look for the planet just after Sunset.

February 22rd -***Star Party at the Observatory***
Yea!

February 29th ***Star party at the Observatory.***
Yea!

New Year Party 2020

Star party's and Events

January 4th Star party at the Observatory. No input and the weather was not good.
Nuts!
January 18th Star Party at the Observatory. No input, the weather was again a problem.
Nuts!

January 25th Star Party at the Observatory, Vince and Vahan on site 6:45 Pm. Sky total overcast we were weathered out again. Departed at 7:00 Pm.
Nuts!

New Year Party 2020

February 2020 Moon

Full 9th, New 23rd, Last Quarter 15th, First Quarter 2nd .

Moon Facts and folk lore

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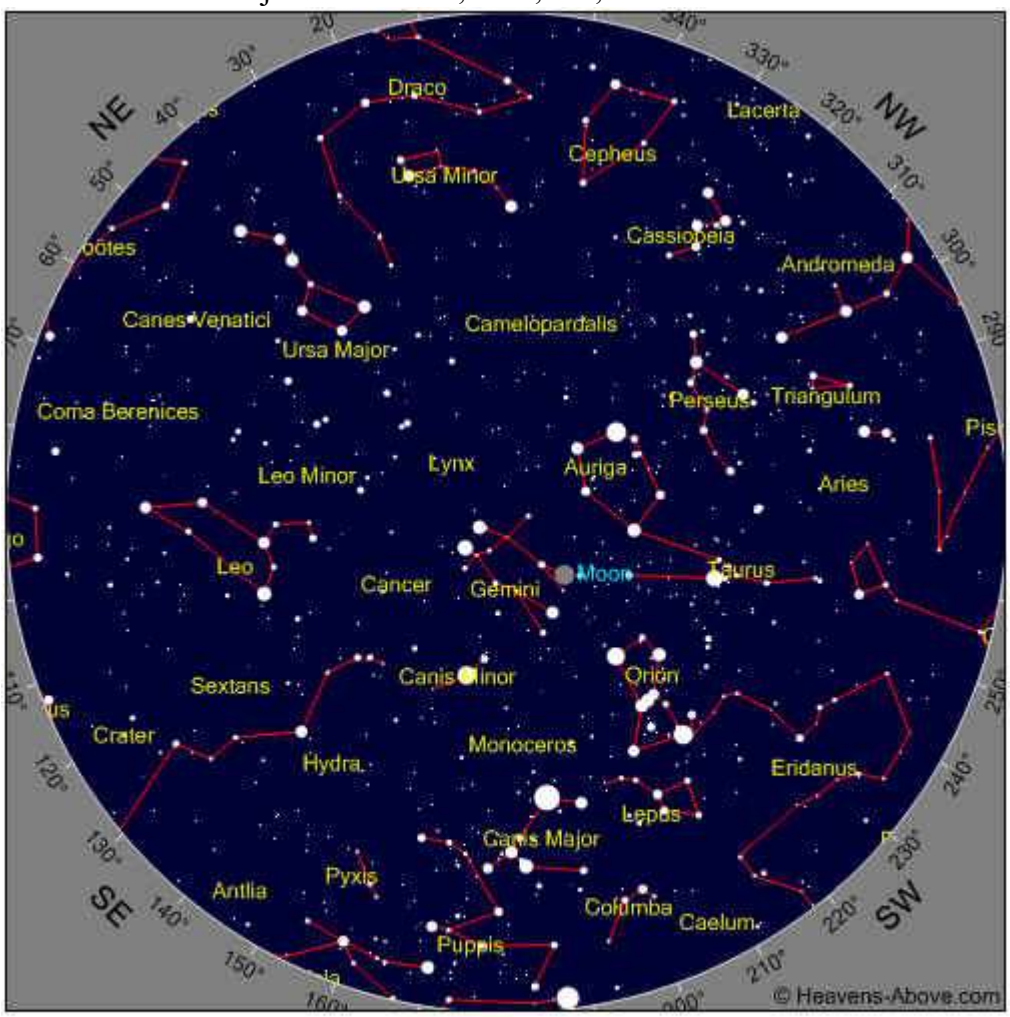
Anomalistic – the length of time it takes the moon to circle the Earth, measured from one perigee (the closest point in its orbit to Earth) to the next: 27 days, 13 hours, 18 minutes, 37.4 seconds.

February 2020 Sky

Some Objects of interest, M42, M1, C14- Double Cluster



Time

Year	Month	Day	Hour	Minute
2020	2	5	22	10

Photo Courtesy of Vahan Yeterian

Sunspots are temporary phenomena on the Sun's Photosphere that appear as spots darker than the surrounding areas. They are regions of reduced surface temperature caused by concentrations of magnetic field flux that inhibit convection. Sunspots usually appear in pairs of opposite magnetic polarity. Their number varies according to the approximate 11 year solar cycle. Individual sunspots or groups of sunspots may last anywhere from a few days to a few months but eventually decay. Sunspots expand and contract as they move across the surface of the Sun with diameters ranging from 16 km to 160,000 km. Larger sunspots can be visible from Earth without the aid of a telescope. They may travel at relative speeds or proper motions of a few hundred meters per second when they first emerge. Indicating intense magnetic activity sunspots accompany secondary phenomena such as coronal loops, prominences, and reconnection events. Most solar flares and coronal mass ejections originate in magnetically active regions around visible sunspot groupings. Although sunspots are at temperatures of roughly 3000-4500 Kelvin the contrast with surrounding material 5700 Kelvin leaves sunspots clearly visible as dark spots. This is because the luminance (which is essentially brightness in visible light of a heated black body) is approximated by the photosphere, these temperatures varies extremely. Sunspots have two parts, the central umbra which is the darkest part where the magnetic field is approximately vertical (normal to the Sun's surface) and the surrounding penumbra which is lighter where the magnetic field is more inclined. Image capture was using a Coronado PST and Imaging plus ccd camera. Exposure time 4 seconds, processed with RegiStax & PSP.

For What its Worth

Solar Wind a brief account

The solar wind streams plasma and particles from the sun out into space. Though the wind is constant, its properties aren't. What causes this stream, and how does it affect the Earth? The corona the sun's outer layer reaches temperatures of up to 2 million degrees Fahrenheit (1.1 million degrees Celsius). At this level, the sun's gravity can't hold on to the rapidly moving particles, and they stream away from the star. These alterations affect the properties of the solar wind, including its magnetic field, velocity, temperature and density. The wind also differs based on where on the sun it comes from and how quickly that portion is rotating. The velocity of the solar wind is higher over coronal holes, reaching speeds of up to 500 miles (800 kilometers) per second. The temperature and density over coronal holes are low, and the magnetic field is weak, so the field lines are open to space. These holes occur at the poles and low latitudes, reaching their largest when activity on the sun is at its minimum. Temperatures in the fast wind can reach up to 1 million F (800,000 C). At the coronal streamer belt around the equator, the solar wind travels more slowly, at around 200 miles (300 km) per second. Temperatures in the slow wind reach up to 2.9 million F (1.6 million C). The sun and its atmosphere are made up of plasma, a mix of positively and negatively charged particles at extremely high temperatures. But as the material leaves the sun, carried by solar wind, it becomes more gas-like. As you go farther from the sun, the magnetic field strength drops faster than the pressure of the material does," Craig DeForest, a solar physicist at the Southwest Research Institute in Boulder Colorado said in a statement. "Eventually, the material starts to act more like a gas, and less like a magnetically structured plasma."

As the wind travels off the sun, it carries charged particles and magnetic fields emitted in all directions some of the solar wind is constantly buffeting our planet with interesting effects.
If the material carried by the solar wind reached a planet's surface, its radiation would do severe damage to any life that might exist. Earth's magnetic field serves as a shield redirecting the material around the planet so that it streams beyond it. The force of the wind stretches out the magnetic field so that it is smooshed inward on the sun-side and stretched out on the night side.
Sometimes the sun spits out large bursts of plasma known as coronal mass ejections (CMEs), or solar storms. More common during the active period of the cycle known as the solar maximum, CME have a stronger effect than the standard solar wind. "Solar ejections are the most powerful drivers of the sun-Earth connection," NASA says on its website for the Solar Terrestrial Relations Observatory (STEREO). "Despite their importance, scientists don't fully understand the origin and evolution of CMEs nor their structure or extent in interplanetary space." The STEREO mission hopes to change that.
When the solar wind carries CMEs and other powerful bursts of radiation into a planet's magnetic field, it can cause the magnetic field on the back side to press together, a process known as magnetic reconnection. Charged particles then stream back toward the planet's magnetic poles, causing beautiful displays known as the aurora borealis in the upper atmosphere. Though some bodies are shielded by a magnetic field, others lack their protection. Earth's moon has nothing to protect it, so takes the full brunt. Mercury, the closest planet, has a magnetic field that shields it from the regular standard wind, but it takes the full force of more powerful outbursts such as CMEs.
When the high-and low-speed streams interact with one another, they create dense regions known as co-rotating interaction regions (CIRs) that trigger geomagnetic storms when they interact with Earth's atmosphere. The solar wind and the charged particles it carries can affect Earth's satellites and global positioning systems (GPS). Powerful bursts can damage satellites or can push GPS signals to be off by tens of meters. The solar wind ruffles all of the planets in the solar system. NASA's New Horizons mission continued to detect it as it traveled between Uranus and Pluto. "Speed and density average together as the solar wind moves out," Heather Elliott, a space scientist at SwRI in San Antonio Texas said in a statement, " But the wind is still being heated by compression as it travels, so you can see evidence of the sun's rotation pattern in the temperature even in the outer solar system."

We've known about the solar wind since the 1950s, but despite its extensive effects on Earth and on astronauts, scientists still don't know how it evolves. Several missions over the last few decades have sought to explain this mystery.

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ACL Webmaster
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Club Meeting

Reminder Club meeting February 14th at 7:00Pm 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

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