

Astronomy Club of Lompoc
Presents
The Sidereal Times



Bubble nebula(see page 5)

Meeting News

Meeting held in June using the Computer Zoom Video Conferencing program.

10 club members participated, great meeting. Thanks go to Vince Tobin for setting up the capability on computer.

Reminder: ACL club meeting Friday July 10th to be held on Zoom video conferencing program 7:00 Pm.

Lunar Calendar:



New Moon 20th
Full Moon 5th

Winery Astronomy day



Presidents Message

Hello, Members and Supporters of ACL,

Great meeting through Zoom, our first, Friday evening, June 12! Things went very smoothly [thanks to our host, Vince!] as we experienced a lot of good exchanges that felt remarkably like actually being together! Vahan gave an excellent illustrated report on his repair of the 8" Newtonian donated by George Greer of Orcutt. We also had a fascinating discussion [with graphics no less] about sunspots and solar cycles by Vince and Vahan.

Also, at this meeting we discussed the Covid-Aware Guidelines we have established for any Star Parties in the foreseeable future. We don't know when our first "Reopening" Star Party will be, but we do know that it will be for MEMBERS ONLY and we understand how we will interact with each other, each looking out for the well-being of the other.

Our next Zoom meeting will be held on Friday, July 10, 7:00PM, and will feature Dr. Joe Bassi. Dr. Joe will discuss, "Space Force: The History of an Idea." Though not astronomical in nature, this program will help us understand this new phase in the history of VAFB and the impacts it will have on our area, quite probably ACL itself as new personnel and potential new members move here. Until then, keeping looking skyward,
Tom

Events

July 5th Penumbral lunar eclipse occurs when the Moon passes through the Earth's partial shadow, or penumbra. During this type of eclipse the Moon will darken slightly but not completely. The eclipse will be visible throughout most of North America, South America, the Eastern Pacific ocean Western Atlantic ocean and extreme Western Africa.

July 11th *Star Party at the Observatory*, Cancelled Covid -19



July 14th Jupiter at opposition and will be at its closest approach to Earth and its face will be fully illuminated by the Sun. It will be brighter than any other time of the year and will be visible all night long. This will be a good time to observe and photograph Jupiter.

July 18th *Star Party at the Observatory*, Cancelled Covid -19



July 20th Saturn at Opposition. The ringed planet will be at its closest approach to Earth and its face will be fully illuminated by the Sun. It will be brighter than any other time of the year and will be visible all night long. This is the best time to observe and photograph Saturn and its moons.

July 22nd Mercury at greatest Western elongation of 20.1 degrees from the Sun. This is the best time to view mercury since it will be at its highest point above the horizon in the morning sky. Look for the planet low in the Eastern sky just before Sunrise.

July 25th *Star Party at the Observatory*, Cancelled Covid-19.



July 28 and 29 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 comet Marsden and Kracht. The shower runs annually from July 12 to August 23rd, it peaks this year on the night of the 28th and the morning of the 29th. Meteors will radiate from the constellation of Aquarius but can appear anywhere in the sky.

Solar day for school kids



Star party's and Events

June 13th Star Party @ the Observatory, cancelled due to Covid-19.



June 20th Star Party @ the Observatory, cancelled due to Covid-19.



June 27th Star Party @ the Observatory, cancelled due to Covid-19.



New year parties



July 2020 Moon

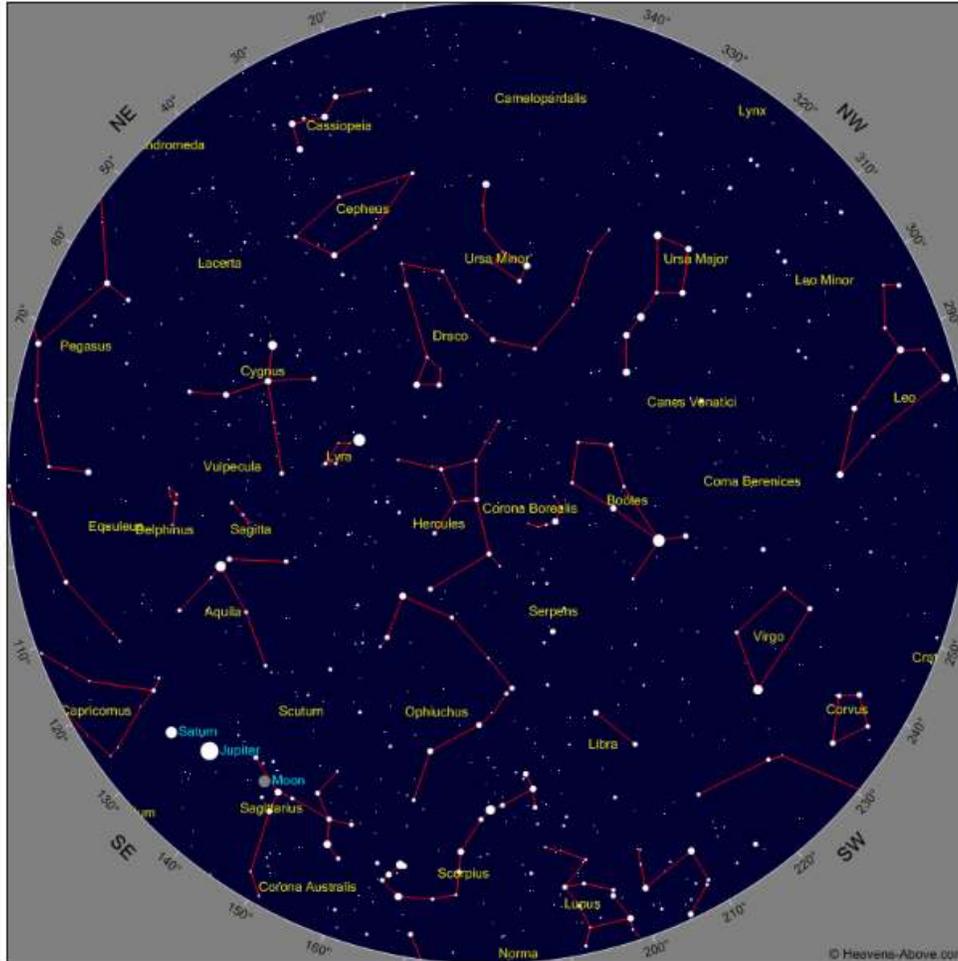


Full 5th, New 20th, Last Quarter 12th, First Quarter 27th

Annual picnic



July 2020 Sky
Some Objects of interest, M42, Double Cluster



Time

Year	2020	Month	7	Day	4	Hour	22	Minute	38
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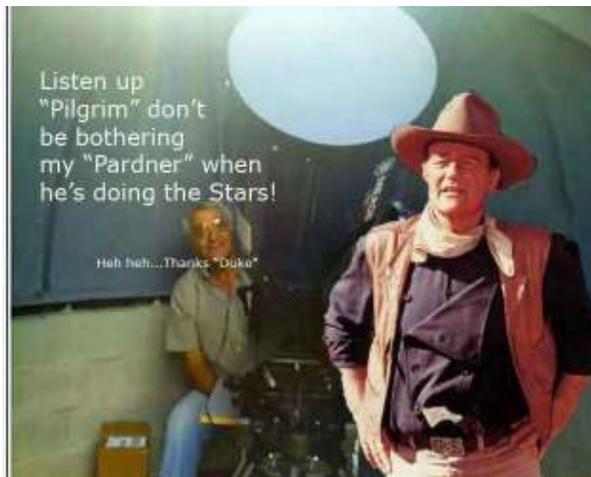


Photo Courtesy Gary Satterfield



The Bubble Nebula NGC 7535 located in the constellation of Cassiopeia is 11,000 light years distant. The bubble was formed by gasses being compressed by strong stellar wind from massive star BD+602522 40 times as massive as our Sun and thousands of times more luminous. As moving gas escapes the star it compresses surrounding gas into a shell. The shell consists of hydrogen oxygen and sulphur and is ionized by the radiation from BD+602522 causing it to glow. The bubble is approximately 6 light years in diameter. BD+602522 is a Wolf-Rayet star in the end stages of its life. It emits fierce stellar winds in the order of 1500 kilometers per second. The surface temperatures are approximately 30,000 to 60,000 degrees Kelvin. The image was captured using an AT8RC, a Canon 500D (modified) DSLR and a hyper tuned CGEM mount guided. 21 frames @ ISO 800/7 minutes and 33 frames at ISO 1600. Darks, flats and bias calibration frames were also included in image processing using Images Plus 4.0 and CS2.

Comet Swan



For What its Worth

Definition of Oort cloud : a spherical shell of Cometary bodies believed to surround the Sun far beyond the orbits of the outermost planets and from which some of these bodies are dislodged, when perturbed, to fall toward the Sun. Named after a Dutch Astronomer Jan Oort, who proposed the existence of the cloud where long period comets come from.

The Oort Cloud lies far beyond Pluto and the most distant edges of the Kuiper Belt. While the planets of our solar system orbit in a flat plane, the Oort Cloud is believed to be a giant spherical shell surrounding the Sun, planets and Kuiper Belt Objects. It's like a big, thick bubble around our solar system, made of icy, comet-like objects. The Oort Cloud's icy bodies can be as large as mountains and sometimes larger. In the silence and darkness between the stars, where our Sun appears as just a particularly bright star, a theorized group of icy objects collectively called the Oort Cloud coast along their orbits like lazy moths around a porch light.

Scale and Distance. The Oort Cloud is the most distant region in our solar system, and it's jaw-droppingly far away, extending perhaps one-quarter to halfway from our Sun to the next star. To appreciate the distance to the Oort Cloud, it's helpful to set aside miles and kilometers and instead use the astronomical unit, or AU — a unit defined as the distance between Earth and the Sun, with 1 AU being roughly 93 million miles. For comparison, Pluto's more elliptical orbit carries it between about 30 and 50 astronomical units from the Sun. The inner edge of the Oort Cloud, however, is thought to be located between 2,000 and 5,000 AU from the Sun, with the outer edge being located somewhere between 10,000 and 100,000 AU from the Sun. If those distances are difficult to visualize, you can instead use time as your ruler. At its current speed of about a million miles a day, NASA's Voyager 1 spacecraft won't enter the Oort Cloud for about 300 years. And it won't exit the outer edge for maybe 30,000 years. When light leaves the Sun, it takes a little over eight minutes to reach Earth, and about 4.5 hours to reach Neptune's orbit. Just under three hours after passing Neptune's orbit, the Sun's light passes beyond the outer edge of the Kuiper Belt. After another 12 hours the sunlight reaches the heliopause, where the solar wind a torrent of charged particles flowing away from the Sun at about a million miles per hour smoothes up against the interstellar medium. Beyond this boundary is interstellar space, where the Sun's magnetic field holds no sway. The sunlight has now been traveling away from the Sun for about 17 hours. Less than one Earth day after leaving the Sun, the sunlight has already traveled farther from the Sun than any human-made spacecraft. Yet somehow it will be another 10 to 28 days before that same sunlight reaches the inner edge of the Oort Cloud, and perhaps as much as a year and a half before the sunlight passes beyond the Oort Cloud's outer edge. The leading idea for the formation of the Oort Cloud says that these icy objects were not always so far from the Sun. After the planets formed 4.6 billion years ago, the region in which they formed still contained lots of leftover chunks called planetesimals. Planetesimals formed from the same material as the planets did. The gravity of the planets (primarily Jupiter) then scattered the planetesimals every which way. Some planetesimals were ejected from the solar system entirely, while others were flung into eccentric orbits where they were still held by the Sun's gravity, but were far enough out that galactic influences also tugged on them. Likely the strongest influence was the tidal force from our galaxy itself. In short, gravity from the planets shoved many icy planetesimals away from the Sun, and gravity from the galaxy likely caused them to settle in the borderlands of the solar system, where the planets couldn't perturb them anymore and they became what we now call the Oort Cloud. Again, that's the leading idea, but the Oort Cloud could also capture objects that didn't form in the solar system. There may be hundreds of billions, even trillions, of icy bodies in the Oort Cloud. Now and then, something disturbs the orbit of one of these icy worlds, and it begins a long fall toward our Sun. Two recent examples are comets C/2012 S1 (ISON) and C/2013 A1 Siding Spring. ISON disintegrated when it passed too close to the Sun. Siding Spring, which made a very close pass by Mars, survived its visit to the inner solar system, but will not return for about 740,000 years. Most known long-period comets have been seen only once in recorded history because their orbital periods are so, well, *long*. (Hence the name.) Countless more unknown long-period comets have never been seen by human eyes. Some have orbits so long that the last time they passed through the inner solar system, our species did not yet exist. Others have never ventured close to the Sun in the billions of years since they formed.

Astronomy Club Officers



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ACL Webmaster
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Club Meeting

Reminder ACL Club meeting July 10th 7:00 Pm on Computer Zoom program.

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/)

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

