

# Astronomy Club of Lompoc Presents The Sidereal Times



M101 (see page 5)

**Meeting News:** At the July meeting we took care of some club business and scheduled the annual ACL picnic.

**Reminder:** ACL Friday August 13<sup>th</sup> club meeting will held at Manzanita School Teachers lounge at 7:00 Pm. Masks are optional.



**Lunar Calendar:**

New Moon 8<sup>th</sup>  
Full Moon 22<sup>nd</sup>

(BBQ Picnic photos 24 July 2021 in this ACL issue)



**Presidents Message**

Hello, All You Sky Wanderers,

While I know *most of us* don't actually travel the space-ways, we do keep our focus on matters off-planet more than the average citizen. It is this common bond that brings us together no matter the depth of our astronomical knowledge or equipment. This bond served us well when a good group of our motley crew came together on Saturday the 24<sup>th</sup> to celebrate an "early" Annual Picnic. After so many months not being together, and missing the event entirely last year, it was only right we gather as soon as we safely could.

Over a dozen of us, members and family, shared excellent food and stories at River Park on a perfectly delightful day with only minor bouts of wind. though a number of our crew were missed, they were in our thoughts and words.

Despite a thin veil of high clouds, telescopes did allow us views of the sun. Especially enjoyable was the sight of numerous prominences, plages, and other surface features through the H-Alpha scope brought by Vince. With Tom's two white-light filtered scopes, however, of the five sunspots noted by SpaceWeather.com, only one could be seen and even it got lost in the cloudy veil before long.

Big attention, and thanks, has to be directed to our Master of the Grill, Chef Vahan, who once again and after long delay, brought his skills to the coals and served up amazing tri-tip. Keeping a constant eye on the job, he moved the steaks around to render perfect degrees of doneness for all tastes. Also, a huge shout-out goes to Jana for her thinking in advance of so many details and for furnishing us with needed table coverings, *real* utensils, and closing the meal with an incredible ACL logo-topped chocolate cake.

Every attendee gets big applause for the delicious sides and salads, donuts, brownies and pineapple upside down cake to make this meal memorable among all our picnics.

Photos herein attest to the spirit of celebration we all enjoyed. Skyward,

Tom

## Events

**AUG 7<sup>th</sup> 14<sup>th</sup> and 28<sup>th</sup>** *Star Partys at the Observatory.*



Yes!

**August 2** Saturn at opposition it will be at its closest approach to Earth and will be brighter than any other time of the year and will be visible all night long. Best time of year to photograph and view the ringed planet and some of its brightest moons.

**August 12** Perseids meteor shower is one of the best meteor showers to observe. It produces up to 60 meteors per hour at its peak. It is produced by debris left by Comet Swift Tuttle and produces a large number of bright meteors. Meteors will radiate from the constellation Perseus but can appear anywhere in the sky.

**August 19** Jupiter at opposition and will be at its closest approach to Earth. It will be brighter than any other time of the year. This will be a good time to photograph or view the Planet.

**August 22** Full moon blue Moon. This phase occurs at 12:02 UTC. This Moon is known by early native American tribes as The Sturgeon Moon because the large Sturgeon fish of the Great lakes were more easily caught at this time of year. It has also been known as the Green Corn Moon and the Grain Moon. Since this is the 3<sup>rd</sup> of 4 full moons in this season it is known as a Blue Moon. This rare event only happens once every few years. So the extra full moon of the season is known as a Blue Moon. Blue Moons occur on average every 2.7 years.



## Star party's and Events

**July 3, 10, 17, 21** *Star Party @ observatory, Cancelled due to weather.*



Nuts!

*The Cake with Club Logo*



## August 2021 Moon

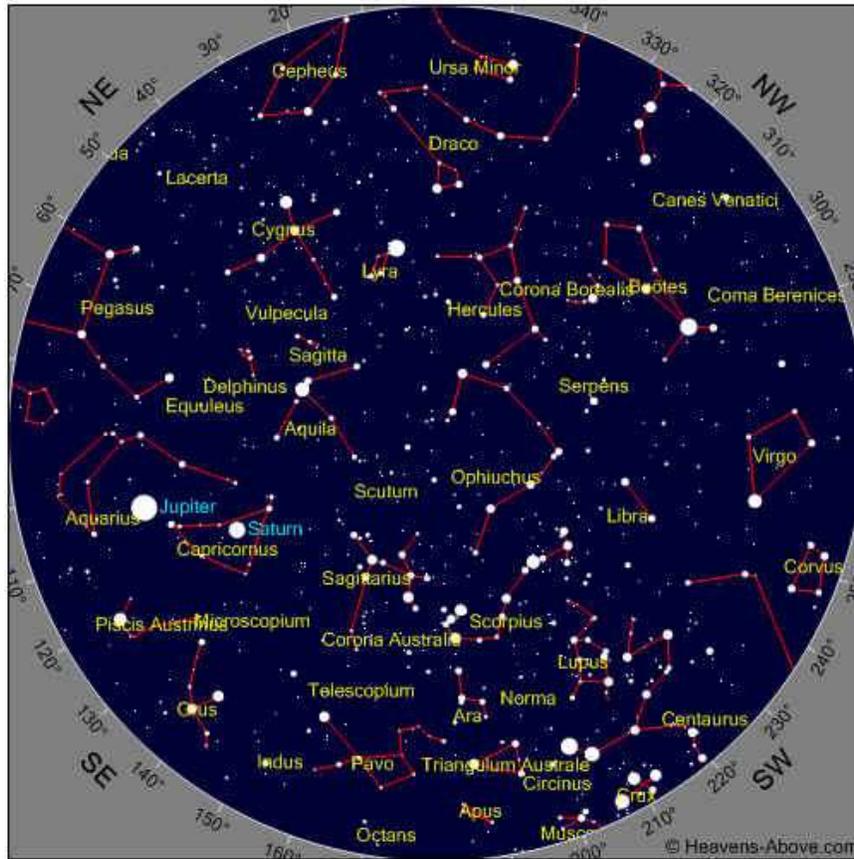


Full 22, New 8, Last Quarter 30, First Quarter 15



# August 2021 Sky

Some Objects of interest, M13, Jupiter, Saturn, M57, M27



### Time

Year	2021	Month	8	Day	2	Hour	21	Minute	10
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**Photo Courtesy Hubble Telescope**



The Pinwheel Galaxy Messier 101 or NGC 5457 is a face on spiral galaxy 21 million light years from Earth in the constellation of Ursa Major. It is a large galaxy with a diameter of 170,000 light years. By comparison the Milky Way has a diameter of 100,00 light years. M101 has about a trillion stars, about twice the number in the Milky Way. It has a disk mass on the order of 100 billion solar masses with a central bulge of about 3 billion solar masses. Its characteristics can be compared to the Andromeda Galaxy. M101 has a high population of H II regions many of which are very large and bright. H II regions usually accompany the enormous clouds of high density molecular hydrogen gas contracting under their own gravitational force where stars form. H II regions are ionized by large numbers of extremely bright and hot young stars. Those in M101 are capable of creating hot super bubbles. Three are prominent enough to receive NGC numbers—NGC 5461, NGC 5462 and NGC 5471.

M101 is asymmetrical due to the tidal forces from interactions with its companion galaxies. These gravitational interactions compress interstellar hydrogen gas which then triggers strong star formation activity in M101's spiral arms and can be detected in ultra violet images. In 2001 the x-ray source P98, located in M101, was identified as an ultra luminous X-ray source – a source more powerful than any single star but less powerful than a whole galaxy. It received the designation M101 ULX-1. In 2005 observations showed the presence of an optical counterpart strongly indicating that M101 ULX-1 is an X-ray binary. Further observations showed that the system deviated from the expected models---the Black Hole is just 20 to 30 solar masses and consumes material at a high rate than theory suggests. It is estimated that M101 has about 150 globular clusters, the same number as the Milky Way's globular clusters. There have been 4 recorded supernovae in M101 (SN 1909A, SN 1951H, SN 1970G and SN 2011fe). The last one was discovered on August 24, 2011. This type Ia supernova reached magnitude +9.9 and was visible with small scopes.

## **For What It's Worth**

**Apochromatic lenses:** A lens or optical system virtually free of chromatic aberration which for practical purposes means that light of at least three different wavelengths is brought to focus at the same point. The best apochromatic lenses use fluorite crystal and may correct three different wavelengths with only two optical elements. However, because fluorite is expensive to manufacture and because of its brittleness is difficult to grind and polish and mount. High quality apochromatic refracting telescopes are costly. Reflecting telescopes, on the other hand, are apochromatic in performance without the extra cost.

**Refraction:** The refraction of light rays passing through the Earth's atmosphere is due to Variations in the density and temperature which produce corresponding variations in the refractive index. Atmospheric refraction gives rise to a shift in the apparent direction of the celestial object. The effect increases the observed altitude of a celestial Object and is greatest at the horizon. Unusual density variations close to the surface may produce mirages, shimmer and other deceptive effects.

**Light intensity:** The reduction in the intensity of light from a celestial body is due to absorption and scattering by Earth's atmosphere. It increases from the zenith to the horizon and effects short wavelengths more than long wavelengths, so that objects near the horizon appear redder than they do at zenith. The brightness of a star in the zenith will be reduced by only 0.3 magnitudes whereas the extinction at 20 degrees altitude is about 0.9 magnitude and at 10 degrees altitude about 1.6 magnitudes.

**Aberration of star light:** The difference between the observed position of a star and its true direction is a combined result of the observers motion across the path of the incoming star light and the finite speed of light. The effect is similar to that observed by someone walking in the rain. Though the rain is in fact falling vertically, because of the person's motion the rain appears to be falling at an angle. There are three components of the aberration of star light, Annual aberration caused by Earth's revolution around the Sun, Diurnal Aberration cause by Earth's axial rotation and a very small Secular Aberration caused my the motion of the solar system through space. Stars on the Ecliptic appear to move To-and-Fro. Stars 90 degrees from the ecliptic appear to trace out a circle and stars in intermediate positions trace out ellipses.

**Astigmatism:** A form of optical aberration in which the focus changes from the center to the edges of the field of view. In the presence of astigmatism the problem is compounded because there are two separate astigmatic focal surfaces. Field curvature varies with the square of the field angle or the square of the image height. Positive lens elements usually have inward curving fields and negative lenses have outward curving fields. Field curvature can be corrected to some extent by combining positive and negative lens elements. Lenses with virtually no field curvature are called flat-field lenses.



## *Astronomy Club Officers*



President  
Tom Gerald

Vice President &  
Treasurer  
Jana Hunking

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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 Aug 13<sup>th</sup> 7:00 PM  
Manzanita School Teachers Lounge Wear your Mask.

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

