

# Astronomy Club of Lompoc Presents The Sidereal Times



Chamaeleon Cloud (see page 5)

### Meeting News:

At the March ACL meeting Mike McDonough gave a very good presentation on electromagnetic spectrum. Discussed the show and tell on the April Eclipse for Lompoc sidewalk folks.

**Reminder:** ACL club meeting April 12<sup>th</sup> will be held at Manzanita School Teachers Lounge 7:00 Pm.



### Lunar Calendar

New Moon 8  
Full Moon 23

### Photo from the Hubble telescope



**"Name the Object Quiz" feature page 7.**  
Last Month the object was the Bubble Nebula, NGC7635

### Presidents Message

**We welcomed** a new member in our club- **James Aranguren**, a recent graduate of UCSB, and showing enthusiasm for astronomy and willing to help us out with activities of which we are grateful! In fact he offered to do a presentation about the sun in May. **Thank You:** Mike McDonough, who gave our March Presentation about Light and color and went deeper into explaining the Electromagnetic Spectrum, with added visuals, which helped all understand that interesting and colorful subject. **Thank You:** Vahan Yeterian and Edmund Burke whom have been working on a grant to help pay for a new telescope and mount for our Observatory. The one we have is old and is not working well.

**The April 8<sup>th</sup> Total Solar Eclipse** will be the **last** closest Total Eclipse for 21 years ( 2045) in our area! Next one is Alaska 2033, Only 3 states of Montana, North and South Dakota in 2044, then many states including Northern Calif. In Aug 12, 2045.

**We Need Help from our Members!** .....for the Partial Eclipse in Lompoc Come Anytime from 10 am 12:17pm. **Max eclipse is at 11:10 am** to be at the front of Walmart with table in Lompoc to help Tom Gerald our VP, to pass out 20 solar glasses that Jana ordered, and make sure we get them back so we can hand them to another person waiting to see the eclipse. If you have a telescope with a solar filter that would be wonderful if you would bring that also and show the public the Partial Eclipse through your scope. You may want to bring a chair and water and a hat for yourself.

The Max time of 11:10 to 12:17 will be the most crowded time and **we would need you the most then to help.** People will be asking what this eclipse is about so any information you can tell the public will be helpful. It will also be a great time to inform the public about our club. **April Presentation:** Jana, and members Kate and Steve Medvedoff will be traveling to **Texas** to view the totality. Jana will be doing a presentation on that experience and have many visuals to explain this phenomenon. Kate and Steve are willing to share their time there also with us.

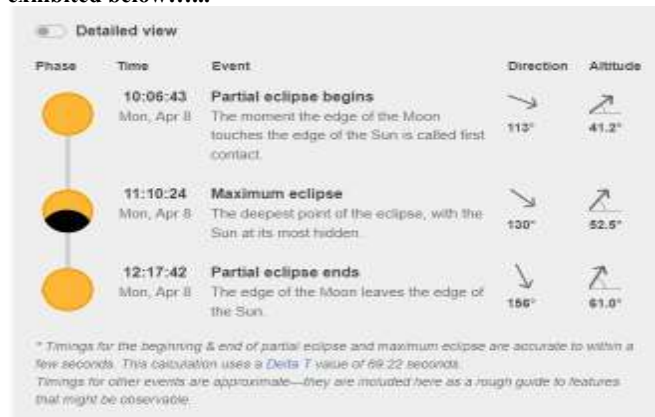
Hoping for clear skies during the eclipse! Jana

## Events

### April 6, 13, 27 -Star Party at the Observatory



**April 8<sup>th</sup>** Total Solar Eclipse occurs when the Moon completely blocks the Sun. This is a rare once-in-a life time event for viewers in the United States. The last total solar eclipse visible in the continental USA occurred in 2017 and the next one will not take place until 2045. The path of totality will begin in the Pacific ocean and move across parts of Mexico and the Eastern USA and Nova Scotia. The total eclipse will be visible in parts of Texas, Arkansas, Missouri, Illinois, Indiana, Kentucky, Ohio, Pennsylvania, New York, Vermont, New Hampshire and Maine. **In Lompoc it will be a partial eclipse as exhibited below.....**



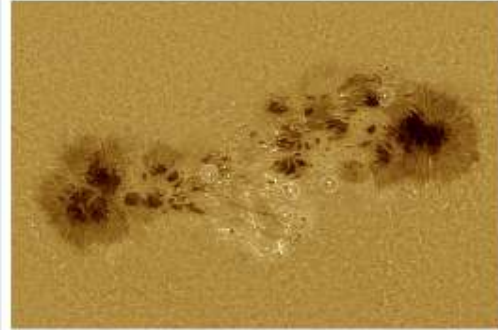
**April 22, 23** Lyrids Meteor Shower is an average shower usually producing about 20 meteors per hour at its peak. It is produced by dust particles left behind by comet C/1861 G1 Thatcher. The shower peaks this year on the night of the 22<sup>nd</sup> and morning of the 23<sup>rd</sup>. These meteors can sometimes produce bright dust trails that last for several seconds. Meteors will radiate from the constellation of Lyra but can appear anywhere in the sky.

**April 23** Full Moon will be located on the opposite side of the Earth as the Sun. This phase occurs at 23:50 UTC. This full Moon was known by early native American tribes as the Pink Moon because it marked the appearance of the Moss Pink, or wild ground Phlox. Many coastal tribes called it the Fish Moon because this was the time that the Shad swam upstream to spawn.

## Star party's and Events

### March 9, 16, 30 Star party at the observatory. (Poor Weather)

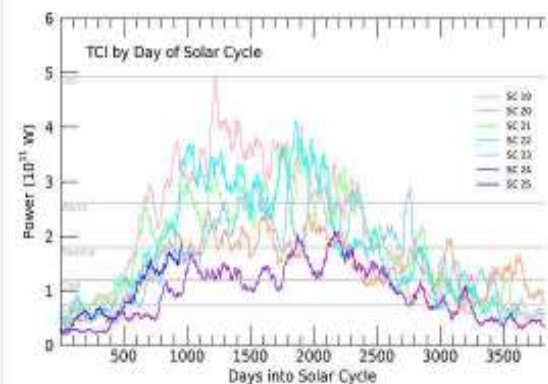
**ELLERMAN BOMBS:** At the beginning of the week, sunspot AR3315 didn't exist. Now it is the biggest and most dangerous sunspot on the solar disk. Maximilian Teodorescu photographed the fast-growing active region yesterday and found it crackling with bomb-blasts:



These are **Ellerman bombs**—magnetic explosions about one-millionth as powerful as true solar flares. A handful are circled above for reference. They are named after physicist Ferdinand Ellerman who studied the tiny blasts in the early 20th century. Of course, "tiny" is relative. A single Ellerman bomb releases about  $10^{26}$  ergs of energy—equal to about 100,000 World War II atomic bombs.

Explosions like these are a sign of magnetic complexity in a sunspot. Opposite polarities bump together, **reconnect**, and—boom. A full-fledged flare may not be far behind. **Solar flare alerts: SMS Text**

**THE THERMOSPHERE IS WARMING UP:** When solar activity is high, Earth's upper atmosphere puffs up like a marshmallow held over a campfire. That's happening now. Since Solar Cycle 25 began, the Thermosphere Climate Index (TCI) has increased nearly 10-fold.



TCI is a number published daily by NASA, which tells us how hot Earth's upper atmosphere is. The thermosphere, the very highest layer of our atmosphere, literally touches space and is a sort of "first responder" to solar activity.

Linda Hunt of Science Systems and Applications, Inc. created the plot, above, which shows how TCI during Solar Cycle 25 compares to other solar cycles of the past. So far, the thermosphere is about twice as warm during Solar Cycle 25 as it was at the same point in the previous solar cycle. [data](#).

"The sun is coming more alive now and looks ready to make a run at exceeding the max TCI of Solar Cycle 24," notes Dr. Marty Mlynyczak of NASA.

As the thermosphere puffs up, it increases aerodynamic drag on Earth-orbiting satellites. Indeed, this is a key reason for [the loss of dozens of Starlink satellites](#) in Feb. 2022. If current trends continue, drag will increase even more as Solar Cycle 25 reaches its peak (Solar Maximum) in 2024 or 2025.

## April 2024 Moon



Full 23, New 8, Last Quarter 2, First Quarter 15

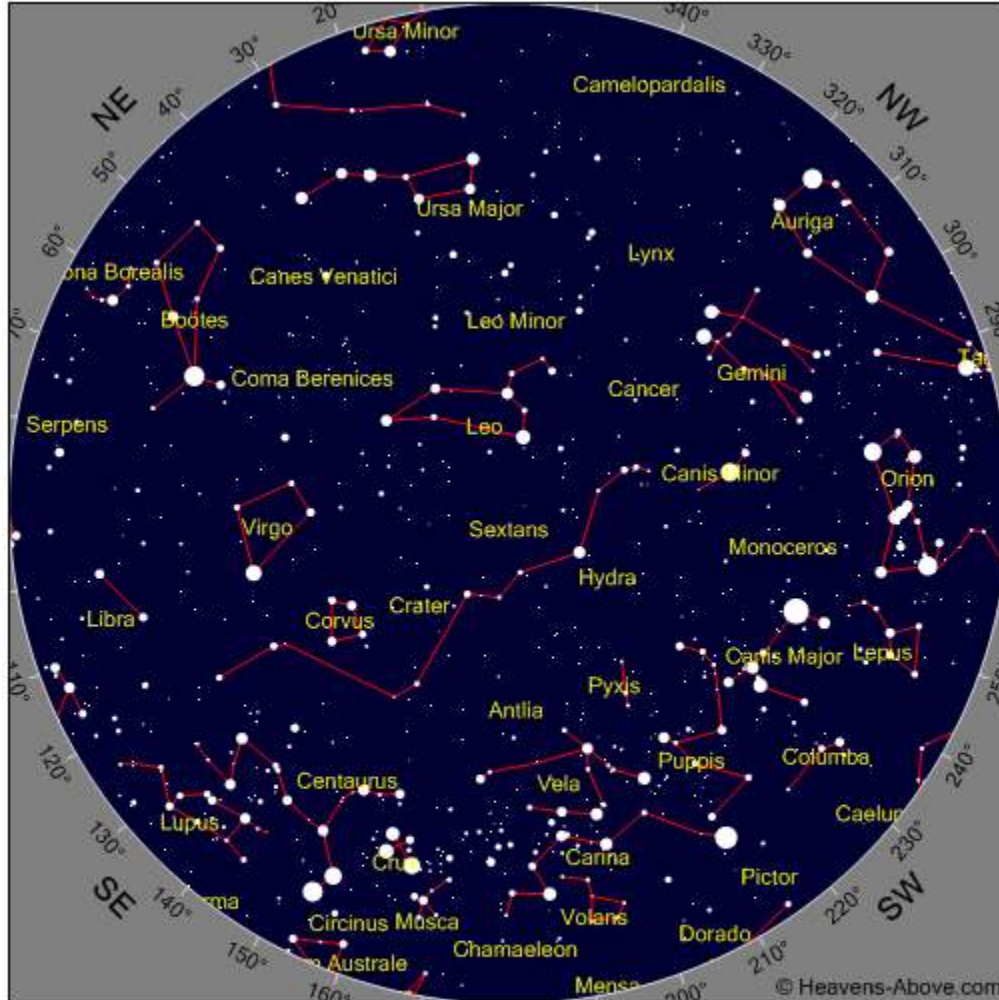
### Moon Facts and folk lore

At full moon and new moon, the Sun, Earth and moon are lined up, producing the higher than normal tides (called spring tides, for the way they spring up). When the moon is at first or last quarter, smaller neap tides form. The Moon's 29.5-day orbit around Earth is not quite circular. When the moon is closest to Earth (called its perigee), spring tides are even higher, and they're called perigean spring tides.

**What did one Tectonic plate say when he bumped into the other?....."Sorry my Fault".  
What kind of fish is made up of 2 atoms.....2NA**



April 2024 Sky  
Some Objects of interest M42



Time

Year	2024	Month	4	Day	5	Hour	21	Minute	20
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Photo Courtesy of NASA



This NASA Hubble Space Telescope image captures one of three segments that comprise a 65-light-year wide star-forming region named the Chamaeleon Cloud Complex. The segment in this Hubble composite image, called Chamaeleon Cloud I (Cha I), reveals dusty-dark clouds where stars are forming, dazzling reflection nebulae glowing by the light of bright-blue young stars, and radiant knots called Herbig-Haro objects. Herbig-Haro objects are bright clumps and arcs of interstellar gas shocked and energized by jets expelled from infant "protostars" in the process of forming. The white-orange cloud at the bottom of the image hosts one of these protostars at its center. Its brilliant white jets of hot gas are ejected in narrow torrents from the protostar's poles, creating the Herbig-Haro object HH 909A. The cross-like spikes around bright stars in the image occur when light waves from a very bright point source (like a star) bend around Hubble's cross-shaped struts that support the telescope's secondary mirror. As the light waves pass these struts, they coalesce on the other side, creating the bright, spikey starburst effect we see. Hubble studied Cha I as part of a search for extremely dim, low-mass brown dwarfs. These "failed stars" lie somewhere in size between a large planet and a small star (10 to 90 times the mass of Jupiter), and do not have enough mass to ignite and sustain nuclear fusion in their cores. Hubble's search found six new low-mass brown dwarf candidates that are helping astronomers better understand these objects.



## **For What its Worth**

**Hubble Space Telescope (HST)**, the first sophisticated optical observatory placed into orbit around Earth. Earth's atmosphere obscures ground-based astronomers' view of celestial objects by absorbing or distorting light rays from them. A telescope stationed in outer space is entirely above the atmosphere and receives images of much greater brightness, clarity, and detail than do ground-based telescopes with comparable optics.

After the U.S. Congress had authorized its construction in 1977, the Hubble Space Telescope (HST) was built under the supervision of the National Aeronautics and Space Administration (NASA) of the United States and was named after Edwin Hubble, the foremost American astronomer of the 20th century. The HST was placed into orbit about 600 km (370 miles) above Earth by the crew of the Space Shuttle Discovery on April 25, 1990.

The HST is a large reflecting telescope whose mirror optics gather light from celestial objects and direct it into two Cameras and two spectrographs (which separate radiation into a spectrum and record the spectrum). The HST has a 2.4-metre (94-inch) primary mirror, a smaller secondary mirror, and various recording instruments that can detect visible, ultraviolet and infrared light. The most important of these instruments the wide-field planetary camera can take either wide-field or high-resolution images of the planets and of galactic and extragalactic objects. This camera is designed to achieve image resolutions 10 times greater than that of even the largest Earth-based telescope. A faint-object camera can detect an object 50 times fainter than anything observable by any ground-based telescope; a faint-object spectrograph gathers data on the object's chemical composition. A high-resolution spectrograph receives distant objects' ultraviolet light that cannot reach Earth because of atmospheric absorption.

About one month after launch, it became apparent that the HST's large primary mirror had been ground to the wrong shape owing to faulty testing procedures by the mirror's manufacturer. The resulting optical defect, spherical aberration, caused the mirror to produce fuzzy rather than sharp images. The HST also developed problems with its gyroscopes and with its solar-power-arrays. On December 2–13, 1993, a mission of the NASA space shuttle Endeavour sought to correct the telescope's optical system and other problems. In five space walks, the shuttle astronauts replaced the HST's wide-field planetary camera and installed a new device containing 10 tiny mirrors to correct the light paths from the primary mirror to the other three scientific instruments. The mission proved an unqualified success, and the HST soon began operating at its full potential, returning spectacular photographs of various cosmic phenomena.

Three subsequent space shuttle missions in 1997, 1999, and 2002 repaired the HST's gyroscopes and added new instruments including a near-infrared spectrometer and a wide-field camera. The final space shuttle mission to service the HST, intended to install a new camera and an ultraviolet spectrograph, was launched in 2009. The HST is scheduled to remain operational through at least 2021, after which it is expected to be replaced by the James Webb Space Telescope equipped with a mirror seven times larger than that of the HST.

The HST's discoveries have revolutionized astronomy. Observations of Cepheid variables in nearby galaxies allowed the first accurate determination of Hubble's constant, which is the rate of the universe's expansion. The HST photographed young stars with disks that will eventually become planetary systems. The Hubble Deep Field, a photograph of about 1,500 galaxies, revealed galactic evolution over nearly the entire history of the universe. Within the solar system, the HST was also used to discover Hydra and Nix, two moons of the dwarf planet Pluto.



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**Club Meeting**

**Reminder** Club meeting April 12<sup>th</sup> 7:00 Pm  
**Manzanita School Teachers lounge.**  
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/)

[Sunrise and sunset times in Lompoc \(timeanddate.com\)](http://timeanddate.com/)

[Moonrise, Moonset, and Moon Phase in Lompoc \(timeanddate.com\)](http://timeanddate.com/)

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

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

<https://spaceweather.com>

<https://www.space.com>

<https://skymaps.com>

**“Name the object Quiz”**



Answer in May News Letter

**ACL Club Logo**

