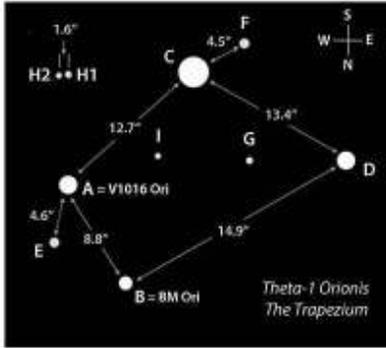


Astronomy Club of Lompoc Presents The Sidereal Times



The Trapezium (see page 5)

Meeting News:

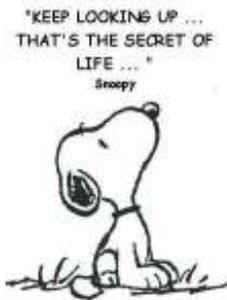
At the April ACL Zoom video meeting we had short talk about the passing of David McNally on April 1st. We also discussed the possibility of having a picnic and a star party sometime later this year.

Reminder: ACL club meeting May 14th will be held on Zoom video again due to Covid-19 virus



Lunar Calendar

New Moon 11th
Full Moon 26th



Presidents Message

Hello, Fellow Star Dust,

The City of Lompoc is now taking reservations for the various City Parks! We are working with them now to secure a site for us to gather in July for a picnic/solar-viewing party. Past experience has shown that these spots are snatched up quickly, so we will do our best to get a good spot. You will be informed of when and where as soon as we have a location.

Speaking of viewing the sun, Cycle 25 is now a reality, with the days of an unblemished face of the sun being fewer than those with sunspots. The last week of April we watched three clusters of sunspots active at the same time. I have been checking NASA's SpaceweatherLive.com daily for three years and this is the first time I have seen three sunspots visible at once. So far, however, I have had to be satisfied with viewing online only as our daily cloud cover has made direct viewing impossible and one spot is moving out of sight as I write.

Joe Bassi introduced me to SpaceweatherLive, as it relates to one of his specialties; his first presentation to the Club was about space weather. Joe will return to our June meeting for an in-depth look at NASA's "next generation" space telescope scheduled for launch this decade. The Wide Field Infrared Survey Telescope is named the Nancy Grace Roman Space Telescope, honoring NASA's very first chief of astronomy. NASA calls her "the Mother of Hubble" for her long advocacy for the SPACE TELESCOPES that now allow scientists to study the depths of the universe from outside the earth's atmosphere. Joe's program follows nicely Jana's discussion of the women of NASA at our May meeting.

Until then,
Tom

Events

May 1, 8, 15 -*Star Party at the Observatory Cancelled / corona Virus*



May 6,7 Eta Aquarids meteor shower is an above average shower capable of producing up to 60 meteors per hour at its peak. Most of the activity is seen in the Southern hemisphere. In the Northern hemisphere the rate can reach about 30 meteors per hour. It is produced by dust grains left behind by comet Halley. It peaks this year on the night of May 6th and the morning of May 7th. Meteors will radiate from the Aquarius Constellation but can appear anywhere in the sky.

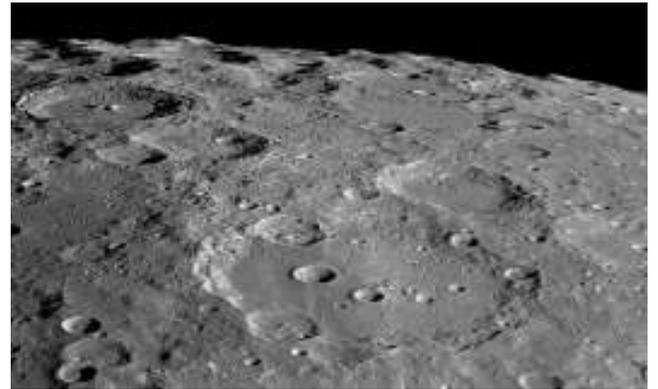
May 17th Mercury at greatest Eastern elongation of 22 degrees from the Sun. This is the best time to view Mercury since it will be at it highest point above the horizon in the evening sky. Look low in the Western sky just after sunset.

May 26 Total Lunar eclipse. The eclipse occurs when the Moon passes completely through the Earth's dark shadow, or Umbra. During this type of eclipse the Moon will gradually get darker then take on a rusty or blood red color. The eclipse will be visible throughout the Pacific Ocean and parts of Eastern Asia, Japan, Australia and Western North America.



Star party's and Events

April 6, 13, & 20th Star Party at the Observatory cancelled due to Corona virus pandemic.



May 2021 Moon



Full 26th , New 11th , Last Quarter 3rd , First Quarter 19th .

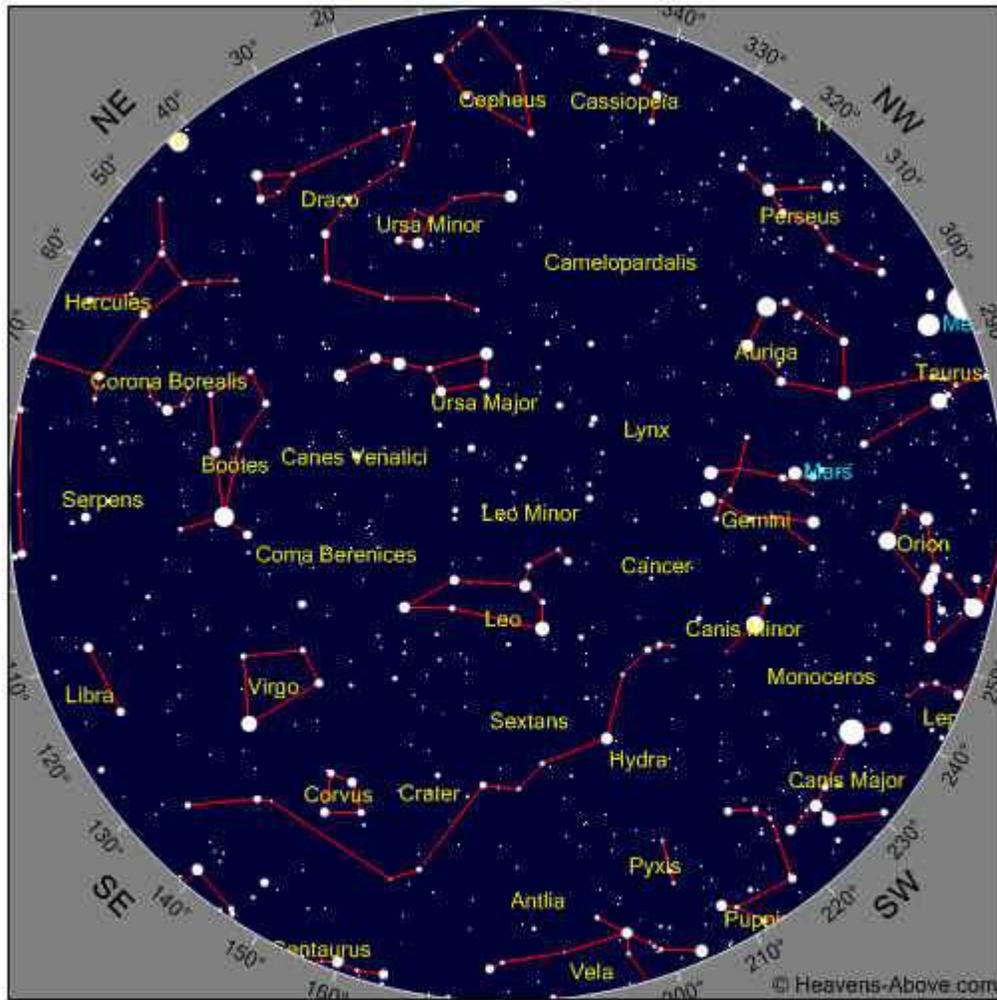
Moon Facts and folk lore

The Moon is the fifth largest natural satellite in the Solar System. At 3,475 km 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.

Rail fences cut during the dry, waning Moon will stay straighter. • Wooden shingles and shakes will lie flatter if cut during the dark of the Moon.

May 2021 Sky

Some Objects of interest, M13, C14

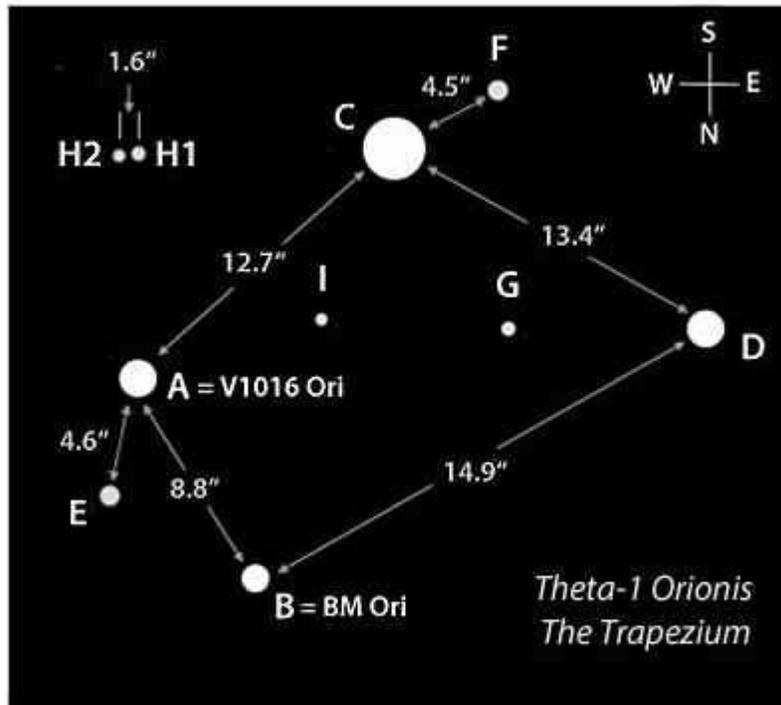


Time

Year	2021	Month	5	Day	5	Hour	20	Minute	39
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Photo Courtesy of the Web



Theta Orionis is the noted quadruple, or multiple star in the heart of the Orion Nebula. This very young group provides the power source that lights up the nebula. It is known as “The Trapezium”. This is probably the best known multiple star in the sky and one of the most interesting for small telescopes. The four brighter components form the little quadrangle called the Trapezium. The primary of the group has a visual magnitude of about 5.4, the spectral type is O6, the spectra of the second and third bright stars are B0 and A7 respectively. The faintest star is an eclipsing binary with a period of 6.471 days and also known under its variable star designation which is BM Orionis. The primary star was identified as an eclipsing binary with a period of 65.432 days and a visual range of 6.7 to 7.7. The trapezium is a bright core of a compact cluster of faint stars which may form an expanding association. Within 5” of the Trapezium are more than 300 stars brighter than 17th magnitude. A study of this group has been made and some evidence of an expansion rate indicate an age of no more than 300,000 years and makes this one of the very youngest star clusters known.

Nearly every single star within the nebula’s confines bears a variable star designation. Most belong to the IN class (“I” for regular, and “N” for association with a nebula). Many of the stars in the nebula are 300,000 years old and or younger and still accreting material from their surroundings. Differences in the accretion rate can set off flares that temporarily boost star's brightness. Young stars are typically fast rotators, generating strong magnetic fields that create large and active star spots that can cause a star’s light to vary with its rotation. Gathered within a region of 1.5 light years in radius they dominate the core of the Orion nebula. Ultraviolet radiation from the Trapezium stars, mostly from the star Theta-1 Orionis powers the star forming regions entire visible glow.

On nights of average seeing, four bright stars in the shape of a trapezoid give the bright quadruple star its name. But when the air settles down, a 6 -inch scope magnifying 125 × or higher will bring the fainter components E and F into view, turning the quartet into a sextet. Keep watch on components A and B at the narrow end of the figure. They're both eclipsing binaries: V1016 Ori ranges from magnitude 6.7 to 7.7 over a period of 65 days and BM Ori from 7.9 to 8.7 every 6.5 days. With its much shorter period, it should be relatively easy to catch BM at both maximum and minimum sometime this season.

For What its Worth

Strong CME effect on Earth A brief Account

"The day the sun brought darkness." On March 13, 1989, a powerful coronal mass ejection (CME) hit Earth's magnetic field. Ninety seconds later, the Hydro-Québec power grid failed. During the 9 hour blackout that followed, millions of Quebecois found themselves with no light or heat, wondering what was going on? It seems hard to believe now, but in 1989 few people realized solar storms could bring down power grids. The warning bells had been ringing for more than a century though. In Sept. 1859, a similar CME hit Earth's magnetic field--the infamous "Carrington Event" sparking a storm twice as strong as March 1989. Electrical currents surged through Victorian-era telegraph wires, in some cases causing sparks and setting telegraph offices on fire. These were the same kind of currents that would bring down Hydro-Québec. "The March 1989 blackout was a wake-up call for our industry," says Dr. Emanuel Bernabeu of PJM, a regional utility that coordinates the flow of electricity in 13 US states. "Now we take geomagnetically induced currents (GICs) very seriously."

What are GICs? Freshman physics 101: When a magnetic field swings back and forth, electricity flows through conductors in the area. It's called "magnetic induction." Geomagnetic storms do this to Earth itself. The rock and soil of our planet can conduct electricity. So when a CME rattles Earth's magnetic field, currents flow through the soil beneath our feet. Québec is especially vulnerable. The province sits on an expanse of Precambrian igneous rock that does a poor job conducting electricity. When the March 13th CME arrived, storm currents found a more attractive path in the high-voltage transmission lines of Hydro-Québec. Unusual frequencies (harmonics) began to flow through the lines, transformers overheated and circuit breakers tripped.

After darkness engulfed Quebec, bright auroras spread as far south as Florida, Texas, and Cuba. Reportedly, some onlookers thought they were witnessing a nuclear exchange. Others thought it had something to do with the space shuttle (STS-29), which remarkably launched on the same day. The astronauts were okay, although the shuttle did experience a mysterious problem with a fuel cell sensor that threatened to cut the mission short. NASA has never officially linked the sensor anomaly to the solar storm. Much is still unknown about the March 1989 event. It occurred long before modern satellites were monitoring the sun 24/7. To piece together what happened, Boteler has sifted through old records of radio emissions, magnetograms, and other 80s-era data sources. He recently published a paper in the research journal **Space Weather** summarizing his findings -- including a surprise: "There were not one, but **two** CMEs," he says.

The sunspot that hurled the CMEs toward Earth, region 5395, was one of the most active sunspot groups ever observed. In the days around the Quebec blackout it produced more than a dozen M- and X-class solar flares. Two of the explosions (an X4.5 on March 10th and an M7.3 on March 12th) targeted Earth with CMEs. "The first CME cleared a path for the second CME, allowing it to strike with unusual force," says Boteler. "The lights went out in Quebec just minutes after it arrived." The March 1989 event kicked off a flurry of conferences and engineering studies designed to fortify grids. Emanuel Bernabeu's job at PJM is largely a result of that "Québec epiphany." He works to protect power grids from space weather -- and he has some good news.

"We have made lots of progress," he says. "In fact, if the 1989 storm happened again today, I believe Québec would not lose power. The modern grid is designed to withstand an extreme 1-in-100 year geomagnetic event. To put that in perspective, March 1989 was only a 1-in-40 or 50 year event--well within our design specs." Some of the improvements have come about by hardening equipment. For instance, Utilities have upgraded their protection and control devices making them immune to type of harmonics that brought down Hydro-Québec. Some utilities have also installed series capacitor compensation, which blocks the flow of GICs. Other improvements involve operational awareness. "We receive NOAA's space weather forecast in our control room, so we know when a storm is coming. For severe storms, we declare 'conservative operations.' In a nutshell, this is a way for us to posture the system to better handle the effects of geomagnetic activity. For instance, operators can limit large power transfers across critical corridors, cancel outages of critical equipment and so on."

(partly copied from SpaceWeather)

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ACL Webmaster
Serf / Minion Aaron Anderson
(New Zealand)



Club Meeting

Reminder Club meeting May 14th 7:00 Pm via Zoom video conferencing.

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)

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

