THE LOS ANGELES ASTRONOMICAL SOCIETY

800 MEMBERS LOOKING UP!

THE BULLETIN

NOVEMBER, 2017

VOLUME 91, ISSUE 11

The Harvest Moon

Above is a photo of the Harvest Moon (full moon) from a couple of nights ago taken with an Explore Scientific 102mm refractor telescope. The single photo is actually six photos merged in Photomatix HDR software, then tweaked a little in Photoshop. It doesn't have the shadow details of the moon when it has a terminator, but does show the entire, tidally locked surface.

Photo Credit: Ray Blumhorst/LAAS

October 5, 2017

In This Issue

LAAS VOTES!

Nominations for club officers and Board members will be heard at the general meeting in November.

Club elections are held at our general meeting in December.

The Mountains of the Moon

by: Ray Blumhorst

The highest mountain on the Moon is higher than the highest mountain in the contiguous U.S. At slightly more than 18,000 feet, Mons Huygens would soar above Mt. Whitney (14,505 ft.) by 3,500 ft. if the two were side by side.

Seeing was less than ideal Oct. 12th (wildfires, wind and all), but late at night out my east-facing window, there squarely in the middle of the "lunar terminator" was a very prominent mountain range known as Montes Apenninus. The peaks of mountains in the Montes Apenninus range stood out very brightly against the pitch black of lower altitude, non-illuminated, lunar landscape.

One week to the day after the Harvest Moon (full moon) of Oct 7th, the waning (getting darker) "quarter moon" was 52% illuminated.

The lunar terminator separates the illuminated and dark portions of the moon.

Several gigantic lunar mountain ranges and the highest lunar mountain are on the edge of the Mare Imbrium (Sea of Showers). Mare Imbrium is a gigantic sea of dark, solidified lava in the northern hemisphere of the moon.

The Mare Imbrium basin is theorized to have formed 3.8 billion years ago, during the Late Heavy Bombardment, when a proto-planet (or giant asteroid) crashed into the surface of the Moon.

The Montes Apenninus mountain range, and other mountain ranges around Mare Imbrium were uplifted when the proto-planet hit. The mountain ranges remain as evidence and are clearly a silent witness to the colossal event.

Basaltic lava later welled up to form the lava sea that's now hardened and known as Mare Imbrium.

Compared to Earth, the Moon is very geologically inactive. When we look at the Moon we can see by comparison how much of Earth's past has been hidden by our active geology, meteorology, plant growth and human development. Plate tectonics (volcanism & earthquakes), weather processes (wind & water erosion), lots of vegetation, and yes even a higher life form building big cities and tall sky scrapers all obscure the history of the surface of the Earth. Wow, how much we can see of our Earth's history if we just scratch the surface of our past with a telescope!

Understanding Lockwood Valley/SKAS

Foundations: What's under the dirt

What's under, or should I say what's in the dirt, is not always something we can control. Gophers, rabbits, snakes, insects. We are in their environment, not they in ours. And above the ground are additional threats. One section of fence was damaged by a mountain lion who decided to cut across the field. Bears also inhabit the area, plus deer, coyotes, spiders, flies, mosquitoes- any number of species, including our own. Also in the ground is the electrical supply- the grid serving the pads, the telephone line, and the toilet waste holding tank. These last items are in our control to some extent. We don't use the telephone very much, but it is there, just in case the cell phones stop working. Like all outside utilities, the phone and the electricity can be interrupted by weather, fire, earthquake, or human actions. Recently, many diseased trees were removed plus others that were just blocking the view of the sky. Occasionally an electrical outlet needs to be swapped out for a new one as the contacts become oxidized. Because we are in a rural area with farms and ranches we experience fluctuating power voltage- from 100 volts to 140 volts is not unusual, necessitating the use of batteries or switching power supplies to power our computers and computerized mounts. We also have 3 pads on the south side of the field that have sunk into the ground. When the field was first cleared of weeds and trees, a hole was dug and the cuttings buried. When pads were being poured, way back when, a concrete delivery truck nearly overturned when it started to sink into the buried and slowly rotting vegetation. Today, the pads which are located over this disposal site are unusable.

Busy little gophers!

Structures: What's above the dirt

What we all see- the trailer, the restroom, the storage shed in the southwest corner (actually a shipping container), the shed known as the 31" shed, the Gordon Mitchell Observatory- these are all things subject to the elements, as are the concrete pads.

The trailer has undergone a great deal of improvement in recent years. A deteriorated roof allowed water to enter, destroying the ceiling, carpeting, allowing mold to grow- leaving it an unusable health hazard. Many thanks are due to several members, but especially Eric Stanis who devoted many hours and materials to restore the interior, and to Penny Kunitani who lead the effort to get the roof recovered with a modern elastomeric coating. Eric also provided us with our sign on the north side of Mitchell Observatory- see the photo at the top of this article. The trailer is now a place where we can get away from the cold and take a nap. By next year, plans are to have the trailer toilet working again so another project can get underway- replacing the existing restroom with one that will be friendlier to those with mobility issues, and possibly a second toilet. I know that adds up to a lot of toilets- one in the trailer, one or two more where we already have the one, plus the not-so-nice outhouse in the southeast corner. It has happened that we have had a lot of attendees for Family Night and once, I was told, we had over 90 (yes, Ninety!) for one event. Where they all parked I have no idea.

Improved trailer interiors

Trailer bathroom (left) and the current restroom

Besides the issue of the restroom, a concurrent issue is the condition of the concrete observing pads. Originally, the Lockwood Valley property was exclusively for the use of the Star Members. It was they who paid for the land, they who cleared the weeds and trees, constructed the Gordon Mitchell Observatory that now houses the club's 16" Newtonian, poured the concrete pads, and added the electrical outlets. Only later were general members allowed access, and later still, Family Night, the brainchild of then-president Mary Brown, was instituted. As for the concrete pads, it can be seen 40 years later that some were poured by people with little experience working with concrete. Those which did not have the "cream" brought to the top surface have suffered from the effects of freezing and thawing, with the aggregate, the rocks mixed into the cement, but here left at the surface, allow water to seep into the concrete, freezing and expanding, then dislodging the thin concrete and smaller rocks from the exposed surface. This is called "spalling". It can be repaired and slowed, but not entirely stopped. Replacement is inevitable.

In the mid 1960's when I first joined the LAAS and I "pushed glass" in the basement workshop of Griffith Observatory, I, with the help of LAAS member Duane Holroyd and with encouragement from my father, made an 8" Newtonian, of which I still have the optical parts. At that time, that was considered a "large" telescope when most handmade scopes were in the 3" to 6" range. The nature of our hobby has changed quite a lot since then. Most members purchase their rigs rather than grinding their own, mostly 10” and larger. And with those fancy rigs come lots of transport containers and the necessities of overnight stays. We are bringing much more stuff with us and a single 92” diameter pad is not enough. Several people, including myself, either spill onto adjacent pads or have our cars parked close enough to work out of the trunk or tailgate.

Another problem we experience at Lockwood is the number of pads that have piers or other modifications. Here is an example of a pad that was modified by a Star member who got several things wrong:

This person added a second layer of concrete over the total surface of an existing pad, making it into a step-hazard. To mitigate the increased height, a skirt of concrete was laid down, but not really fixing the situation. Falling off the edge of this pad puts one's foot at an angle and potentially a person could fall to the ground. The next problem is the second ring of concrete that connects the pad to the pier, which allows vibration from walking on the pad to be transferred to the telescope and any camera attached to the scope. The person who had this work done by a local concrete man did not clear any of this work with the LAAS Board of Directors or the Lockwood Committee. We don't even know how rigid the pier is- how far down into the ground it is sunk is critical in an area that is below freezing every winter. Finally, this pier can only be used by the one person who built it. Once this member has left the club, or no longer wishes to be a Star member, the pier and pad will need to be demolished as it cannot be passed on to another member as it is.

Currently in planning by the Lockwood Committee is the project to remove the old concrete pads and replace them with fewer but larger pads. We are still debating over such issues as leaving the current inner ring of piers in place and having two concentric rings of pads, with the club covering the costs of replacing any existing piers in the outer ring, or to do away with the ring layout in favor of a grid, but necessitating the club replacing all of the existing piers. With the second version we can be certain that the issue over what's underground and unknowable will be cleared by having a standardized pier foundation and connection hub just above ground like you see here.

In the future, all pier foundations will be at the ends of pads and not centered, then all pads will be available to members who use Dobsonians or tripods when the leasing Star member is not present.

Other projects under consideration are a row of roll-back observatories just south of the trailer, where dedicated imagers can set up their rigs for the season, indeed the year. The observatories, while private during the membership of the individual and funded by that individual, would become LAAS property once the Star member terminates his/her lease. Just below the row of observatories will be what I've been calling the "Dobsonian Landing Strip." Planned to be 15 feet wide and 50 feet long, the Landing Strip will be poured and usable before any pads are demolished. It will sit at an angle, taking advantage of the slope of the field, and will have a "French drain" to divert water from rain and melting snow around it. Access by cars will be possible, partially from the northwest side and entirely from the southeast side. This area will also have a concrete path directly to the new restroom which will include a wheelchair ramp. Another advantage of having the pad oriented off of the East-West axis it that most everyone on the pad will have a good view of the western horizon due to some trees having been removed last year.

Maintenance

Until the spring cleanup of May-June 2017, we have relied on volunteers to bring their weed whackers and other garden tools from home to cut back the undergrowth. This has been a mammoth job that goes way beyond just the one Saturday that we can manage to coerce a few people to attend. It really entails several members, most of whom come from Bakersfield, spending several days cutting the weeds, trimming trees, moving the cuttings to the southeast corner where our neighbor, Darrell Kanke, splits the wood into burnable-sized pieces and takes away to his winter woodpile. In order to make the annual weed clearance easier for our dedicated volunteers, I have asked the permission of the Board of Directors to purchase a self-propelled field mower. I hope to see one delivered before winter sets in so we have it available as soon as it's needed in the spring.

Then there are miscellaneous projects like cleaning out the broken garden tools and other project leftovers that have been stored in the container/shed. We also have a pile of metal that needs to be taken methodically to the dump. Many parts associated with forgotten telescope projects clutter up the Gordon Mitchell Observatory and the rails that the roof of this observatory rides on are warped. Recently, a broken window on the trailer was replaced. Also, we have received a couple of cots for use in the trailer and hope to add a couple of bunk beds to back bedroom which recently had its unused closet and desk removed giving more floor space.

Next installment will cover what we plan to do, when we plan to do it, and how we plan to pay for it.

Kevin Gilchrist

Lockwood Committee Chairperson

Family Night, Sept. 27, 2017 - Photo Credit: Spencer SooHoo

Member Profile

George Carroll:
1953 President of the Los Angeles Astronomical Society
and Principal Founder of Stony Ridge Observatory

Authors: Steve Brewster, SRO Historian; and Lew Chilton, LAAS Historian

References: http://www.stony-ridge.org/, LAAS Archive

James Albert Jackson Carroll was born in Belton, Texas in 1902 and grew up on a farm between Belton and Killeen, Texas. In 1910, at the age of 8, the appearance of Halley's Comet kindled a lifelong interest in astronomy.

At just 16 years of age, "George" (his adopted name of unknown origin) built and flew his first airplane. At that time he was one of the youngest pilots in the country. The 1920s saw him "barnstorming" through Texas, flying stunts for circus crowds, and racing motorcycles and speedboats at carnivals. Over his lifetime, he built 20 aircraft, including a gyrocopter in the 1960's.

In 1927, he and three partners formed the Texas Aero Corporation, the first commercial aircraft manufacturing facility in Texas. They designed and built the *Temple Monoplane* to deliver newspapers and mail to remote areas of Texas. The original aircraft no longer exists, but a flying reproduction is on exhibit at the Frontiers of Flight Museum at Love Field in Dallas. In 1970, the state of Texas placed a commemorative plaque on the site of the original hanger to honor these four pioneers of Texas aviation, and a rededication ceremony was held in 2010 for family members, descendants and the public.

In 1930, George married a local girl, Charlotte Emma Reynolds. They moved to Louisiana where George flew a seaplane to offshore oil rigs for a Texas oil company. They relocated to Fort Worth, Texas where George took a position with Braniff Airways as a maintenance engineer at Love Field in Dallas.

In Fort Worth, George became acquainted with a man who had studied astronomy at Harvard College and possessed a 5-inch Brashear refractor that was on loan from that institution. George had not yet been introduced to the reflecting telescope until he met an old preacher who had built three: a 6-, 8- and 10-inch. But compared to the 5-inch Harvard refractor, they were of poor quality. George was unable to find information about how to grind and polish lenses or mirrors and the optical people he came in contact with were reluctant to share their knowledge.

In those years, amateur telescope makers were few and far between, but George was finally able to borrow an old book that was a history of old telescope and lens makers. It proved to be a revelation because of its discussion of the different methods used by the more successful telescope makers. After a careful read of the book, George decided to give it a try. He acquired a 6-inch disk and the necessary abrasives and polishing agents and began to see some results after many months of experimentation and mirror testing, which resulted in a fairly good 6-inch f/10 mirror. After he mounted it in a tube and made a tripod for it, he took it out on the sidewalk. That was in 1934.

One evening when George was observing with his telescope, a car drove by, suddenly stopped and backed up. A middle-aged man emerged, walked over to George and asked if he could have a look through the telescope. George had no objections. He learned that the man had also made a 6-inch reflector but its performance was disappointing. After looking through George's telescope, it was nearly impossible to pry the man away from it. Finally, he said that it was the best reflecting telescope that he had seen and was the equal of a refractor in most respects. The man finally drove off with George's promise to make him one. From then on and for several years after, George found himself in the telescope business.

The Lockheed Years

In 1940, George accepted a job with Vega Aircraft Corporation in Burbank, California. With wife Charlotte and son George Jr., they settled in nearby Glendale, California. As a staff engineer and head of service design, George trouble-shooted aircraft problems for the Army Air Force. When Vega Aircraft merged back into parent company Lockheed Aircraft Corporation in 1943, George continued on as a design and developmental engineer. That was the year Lockheed formed a new division called the Advanced Development Projects (ADP). The ADP produced highly classified, technically challenging aircraft for the military. It soon acquired the sobriquet "Skunk Works," alluding to the popular Al Capp comic strip, "L'il Abner," in which Li'l Abner's pappy brewed a potent beverage from foul smelling skunks and old shoes deep in the piney woods. For Lockheed Skunk Works employees, the malodorous odors they smelled came not from the piney woods but from a nearby plastics factory. George was associated with the Skunk Works for about 20 years but never talked about it, in keeping with ADP's Prime Directive #13.

Left: Ads for Astro Telescope Co. appeared in *Sky & Telescope* magazine in 1946 and 1947.

Right: Partners Carroll & Bohannon, both LAAS members, placed ads in *S&T* in 1954.

In 1946 and again in 1954, George started small businesses making and selling optics, parts and precision optical instruments, but each business venture was short-lived, owing to the demands of his job at Lockheed.

The Stony Ridge Years

In 1947, George and two others formed the "Association of Amateur Astronomers." Ten years later, in 1957, the Association, then numbering 15 members, filed papers to change its name to Stony Ridge Observatory, Inc. Construction immediately began on an observatory in the San Gabriel Mountains near Mount Wilson that would house a large reflecting telescope. Again, it was George who spearheaded its design and engineering. Also in 1957, George donated a 6-inch refractor and a 16½-inch Newtonian-Cassegrainian reflector, both of of his making, to Westmont College in Santa Barbara, California. The 16½-inch was the prototype for the 30-inch that was being built for Stony Ridge Observatory.

Lockheed had become increasingly active in the U.S. space program and was looking for an observatory that could take high-resolution images of the lunar surface for charting possible Apollo landing sites. In 1963, Lockheed funded the completion of Stony Ridge Observatory in return for 1600 hours of telescope time.

George was on the staff of Lockheed's Briar Summit Solar Observatory (later shortened to Lockheed Solar Observatory) that was located at its Rye Canyon facility. He designed and Thomas Tool & Die Co. of Sun Valley, California, built two spar telescopes for the solar observatory, one of which was featured in a July 1970 *Sky & Telescope* article. Pictures of that telescope clearly show the Carroll design features that were taken from the 30-inch telescope at Stony Ridge. After retiring from Lockheed, George became a consulting engineer for Thomas Tool & Die Co.

The LAAS Years

LAAS records are mum about when George first joined after moving to California in 1940. He doesn't appear in the 1948 membership roster - the only roster extant from that era - but had become an active LAAS member and was elected its president in 1953. The Western Amateur Astronomers (WAA) awarded him its G. Bruce Blair Medal in 1971 for his important contributions to amateur astronomy. Charlotte Carroll was a longtime WAA secretary and had faithfully attended its mid-winter and August convention board meetings for many years before she passed away in 1974. George occasionally attended LAAS meetings and was often seen at star parties and at the annual Riverside Telescope Makers Conference where he sometimes displayed his 4-inch solar monochromator.

George Albert Carroll died in 1987 in Tujunga, California. In 2004, five members of Stony Ridge Observatory, using the Carroll 30-inch telescope, discovered a new asteroid. The name "Georgecarroll" was suggested by the discoverers to honor the founding force behind Stony Ridge Observatory. **144633/Georgecarroll** was officially adopted by the Minor Planet Center and the International Astronomical Union. This little asteroid, about 3 miles (4.5 km) in diameter, resides within the asteroid belt between Mars and Jupiter. It will always be a reminder that this quiet, unassuming man made a significant contribution to the science of astronomy, and the LAAS will remember him as one of its own.

(Image: Thomas Tool & Die Co.)

Arroyo Seco Outreach Report

Arroyo Seco Science Magnet School

Highland Park

10/5/2017

Report and Photo credit: Van Webster/LAAS

Members of the Los Angeles Astronomical Society travelled to Highland Park near downtown on Thursday, October 5, 2017 for an evening of planet gazing at the Arroyo Seco Science Magnet School. The club has been visiting this school for a number of years. The campus is tucked into a small canyon in the hills near the Arroyo Seco Parkway. The cluster of temporary buildings is dominated by the citadel like presence of the Southwest Museum building on the hill overhead.

The small parking area at the entrance of the campus was the set up area for the telescopes with a stockade of tall trees on one side and the hills on the other side making for a small window of sky to actually view. Viewing conditions were additionally challenged by a Cal-Trans grade double street light that blasted the parking lot with its bluish rays.

We started out by aiming our instruments at the surrounding landscape. Many of us had the flag on the Southwest Museum tower in view. The flag was flown at half-mast to honor the Las Vegas shooting victims. Heven had found a group of large birds perched on the top of a tall tree and aimed his binoculars for a view.

Saturn eventually became visible and most of us had to move our telescopes to the north west corner of the parking lot in order to see the planet clear of trees. About 150 students, families, teachers and staff took turns at the eyepieces. A staff member passed out raffle tickets to each child who looked through a telescope.

.

Saturn eventually became visible and most of us had to move our telescopes to the north west corner of the parking lot in order to see the planet clear of trees. About 150 students, families, teachers and staff took turns at the eyepieces. A staff member passed out raffle tickets to each child who looked through a telescope.

The raffle was held at 7:30 PM and then all of the families quickly exited the school grounds. As the kids and parents walked out, the Harvest Moon just began to appear above the tree tops leaving the best views to the astronomers as they packed up their gear.

An Outreach Bonus!

Additional outreach report and photos generously submitted by Elizabeth Wong/LAAS

Oct 5 Science Night Outreach. Arroyo Seco Magnet School in Highland Park. Observation site was challenging. Surrounded by a tall hillside, tall trees, bright lamppost, bright lit-up classroom bungalow, with high-intensity security light. Luckily, Saturn cooperated. As did objects directly overhead, (Epsilon Lyrae). Thanks Heven for organizing another successful outreach! Outreach report and photo credit: Elizabeth Wong/LAAS

Van Webster (left) with Don Degregori (right) enjoying conversation before sunset.

LAAS Jackets, T-Shirts, and Caps

Share your club spirit with the public and wear your club colors to help identify you as a member of the LAAS today by ordering a new jacket, t-shirt or cap.

If you would like to purchase club jackets, T-shirts, or caps featuring our club logo, please look for Richard Roosman at the public star party and at our general meeting. Richard will have the club merchandise on sale from 2 PM to 6 PM at the star party.

For further information, feel free to contact Richard at Richardinwalnutpark@msn.com.

You can also use the link on Paypal, if you would like to place an order for club merchandise by using the following link:
http://laas.org/joomlasite/index.php/laas-merchandise

Book Now! Only One Session Available Until 2018!!!

Meet The New Members

Julie Bray-Ali

Emma Hankins & Joseph Di Marco

Jeffrey Baker

Jeffrey Lee and Family

Partha Laha and Venkata Kotamragu

Nader and Melodie Modarres

Gary Agpar

Daniel Yadegar and Family

Philip Estrin

Carlos Salgado

Ken Fancher

Shah Selbe

Aram Hacobian

Please remember to renew your membership once you receive notice from the Club Secretary. Use this link to learn how to renew your membership:

https://fs30.formsite.com/LAAS/MemberRenewal/index.html

Astronomy Magazines

Sky and Telescope renewals should be sent directly to Sky Publishing.

To start a subscription at club rates, send a check payable to "Sky & Telescope" in the amount of $32.95 for a one year subscription to:

Los Angeles Astronomical Society

C/0 Griffith Observatory

2800 East Observatory. Road

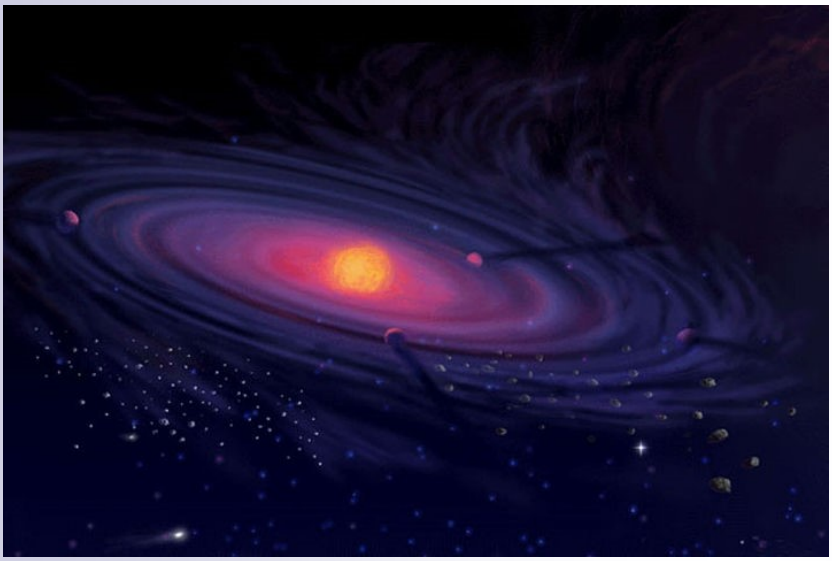
Los Angeles, 90027

ATTN: Treasurer

Be sure to include the exact name and mailing address for your subscription. Then, thereafter, send the renewal bills directly to Sky Publishing. **For a club rate subscription to Astronomy**, send a check payable to Kalmbach Publishing Co. in the amount of $34 for one year or $60 for two years to the above address.
Be sure to include the exact name and mailing address for your subscription. That magazine also requires later subscription renewals to be handled through the LAAS Treasurer.

A Guide To the Night Sky - November, 2017

By Tre Gibbs



HERE WE ARE, right in the middle of Autumn and I find myself with a relatively familiar problem - an evening sky with almost no visible planets to view or talk about. Every planet has it's own particular orbit around our nearest star, the Sun. The closer a planet is to the sun, the faster it will travel around it. For example, Mercury, the planet closest to our sun, takes roughly 88 Earth days (almost 3 months) to make one orbit around the sun. Jupiter, the planet beyond Mars, takes about 12 Earth years to make this same journey, while Neptune - the farthest planet in our solar system, takes about 165 Earth years to orbit the sun once. If your curious about tiny Pluto, it takes about 250 Earth years to go around the sun. See, all of the planets are moving at different speeds, in different orbits around the sun, so naturally there are times when we will see a bunch of them in the night sky and times when we won't. This month is one of those times.

Saturn, The Roman God of Agriculture, is barely visible, appearing very low on the south-western horizon this month as he inches closer and closer toward the sun's glare. Venus, The Goddess of Beauty and Love, is very low on the *eastern* horizon just prior to sunrise, also inching closer to the sun's glare. Both are heading toward the sun's glare - but in opposite directions. Mars is the only planet right now that you can spot in our night sky, but it's very faint and rises around 4:00 am, visible above the eastern horizon by 4:45 - 5:00 am mid month. From Earth's current yet temporary perspective *(since we are moving, too)* the other "naked eye planets" - Jupiter and Mercury - are rendered practically invisible by the sun's glare, as they appear to wander behind and in front of the sun in their own particular orbits.

So let's talk about one of the most recognizable constellations in the night sky, Orion the Hunter. First of all, a constellation is a grouping of stars that form imaginary outlines or meaningful patterns, typically representing animals, mythological people or creatures. There are 88 of them! Orion is one of the easiest constellations to spot in the winter months because of the three stars in a row that make up his belt. There are two bright stars above the belt that make up his shoulders, and two bright stars below that make up his knees or ankles. This particular grouping of stars signal the return of winter as he appears to rise above the eastern horizon this month just prior to midnight. By mid winter, Orion is high overhead at midnight but by early spring, Orion is closely behind the setting sun on the western horizon.

This month's full moon is known as The Full Beaver Moon. In preparation for winter, trappers would take advantage of the beavers engaging in their own busy preparations for the coming winter and harvest their fur. On November 3rd at 10:23 pm, the moon will be at it's fullest phase. Since the moon is constantly moving, orbiting our planet every 28 days (+/-), it will only *technically* be full for a minute or two, but it moves so slowly that it will appear almost full to us down here on earth the day before and the day after as well.

So that's it for this month. Remember to set your clocks back one hour early Sunday morning on the 5th and have a happy, peaceful Thanksgiving.

Tre Gibbs/LAAS

ALMANAC

- **November 4 - Full Moon.** The Moon will be located on the opposite side of the Earth as the Sun and its face will be will be fully illuminated. This phase occurs at 05:23 UTC. This full moon was known by early Native American tribes as the Full Beaver Moon because this was the time of year to set the beaver traps before the swamps and rivers froze. It has also been known as the Frosty Moon and the Hunter's Moon.

- **November 4, 5 - Taurids Meteor Shower.** The Taurids is a long-running minor meteor shower producing only about 5-10 meteors per hour. It is unusual in that it consists of two separate streams. The first is produced by dust grains left behind by Asteroid 2004 TG10. The second stream is produced by debris left behind by Comet 2P Encke. The shower runs annually from September 7 to December 10. It peaks this year on the the night of November 4. Unfortunately the glare from the full moon will block out all but the brightest meteors. If you are extremely patient, you may still be able to catch a few good ones. Best viewing will be just after midnight from a dark location far away from city lights. Meteors will radiate from the constellation Taurus, but can appear anywhere in the sky.

- **November 13 - Conjunction of Venus and Jupiter.** A spectacular conjunction of Venus and Jupiter will be visible in the evening sky. The two bright planets will be extremely close, appearing only 0.3 degrees apart. Look for this impressive pairing in the Eastern sky just before sunrise.

- **November 17, 18 - Leonids Meteor Shower.** The Leonids is an average shower, producing up to 15 meteors per hour at its peak. This shower is unique in that it has a cyclonic peak about every 33 years where hundreds of meteors per hour can be seen. That last of these occurred in 2001. The Leonids is produced by dust grains left behind by comet Tempel-Tuttle, which was discovered in 1865. The shower runs annually from November 6-30. It peaks this year on the night of the 17th and morning of the 18th. The nearly new moon will not be a problem this year. Skies should be dark enough for what should be good show. Best viewing will be from a dark location after midnight. Meteors will radiate from the constellation Leo, but can appear anywhere in the sky.

- **November 18 - New Moon.** The Moon will located on the same side of the Earth as the Sun and will not be visible in the night sky. This phase occurs at 11:42 UTC. This is the best time of the month to observe faint objects such as galaxies and star clusters because there is no moonlight to interfere.

- **November 24 - Mercury at Greatest Eastern Elongation.** The planet Mercury reaches greatest eastern elongation of 22.0 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 evening sky. Look for the planet low in the western sky just after sunset.

Be a part of something great! Join our Outreach team of volunteers today.

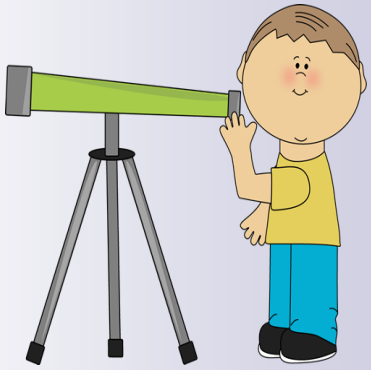
Contact Heven Renteria, our Outreach Coordinator at Outreach@LAAS.org

Need Help With A New Telescope?

Need help with your new telescopes or other astronomy gear? Visit the Garvey Ranch Observatory on any Wednesday night 7 PM to 10 PM for tips and assistance by your fellow LAAS members.

Learn more:

The Garvey Ranch Park Observatory



November

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
29 **4:00 PM** Science Night **6:04 PM** Sunset	30	31	01 **7:00 PM** Garvey	02 **6:15 PM** Outreach - Granada Hills	03 **5:00 PM** Outreach - Silver Lake	04
05 **5:58 PM** Sunset	06	07 **6:00 PM** (Cancelled) Outreach - San Marino	08 **7:00 PM** Garvey **8:00 PM** Board Meeting	09	10	11 **6:00 PM** 60 Inch Night
12 **4:52 PM** Sunset	13 **7:30 PM** General Meeting	14	15 **7:00 PM** Garvey	16	17	18 **2:00 PM** Star Party **5:00 PM** Dark Sky Night
19 **4:48 PM** Sunset	20	21	22 **7:00 PM** Garvey	23 Thanksgiving	24	25
26 **4:45 PM** Sunset	27	28	29 **7:00 PM** Garvey	30 **5:30 PM** Outreach - East LA	01 **5:30 PM** Outreach - Van Nuys	02 

LAAS Members: Please log on to the Night Sky Network (NSN) to view all private and outreach events on the calendar.

Be advised all scheduled events may not be visible on the calendar above.

If you have not registered on the network, please follow this link and register today:

https://nightsky.jpl.nasa.gov/club-apply.cfm?Club_ID=1344&ApplicantType=Member

What Is The Fate of The Universe?

Universe Discovery Guide For November

Andromeda Galaxy: The gravitational attraction between our Milky Way Galaxy and its neighboring spiral galaxy is stronger than the overall expansion of the universe. For the story behind this image: http://www.galex.caltech.edu/ media/glx2012-03r_img01.html Credit: GALEX, JPL-Caltech, NASA

Discover the universe with your family and friends!

IN THIS GUIDE:

Download the guide by following this link:

https://nightsky.jpl.nasa.gov/docs/11UDGAndromedaGalaxy.pdf

Always use Adobe Acrobat Reader to view the Guides on a computer.

NASA'S NIGHT SKY NETWORK - FREE WEBINARS

Each month, the NSN hosts a free online webinar for all registered members of the Night Sky Network.

Log on to your NSN account to learn more.
9:00 PM Eastern/ 6:00 PM Pacific
Topic and Speaker TBD
Check the NSN newsletter for further information.

YouTube Playlist : All NSN Astronomy Webinars
All Past Webinars and Resources on NSN

FUNDRAISING FOR THE LAAS

The LAAS is now listed on Amazon Smiles. When you purchase any goods on Amazon.com, Amazon will donate a small percentage of the funds they receive from you, back to the LAAS. Here's some information to help bring in funds for our club projects:

What is AmazonSmile?

AmazonSmile is a simple and automatic way for you to support your favorite charitable organization every time you shop, at no cost to you, with the added bonus that Amazon will donate a portion of the purchase price to your favorite charitable organization., such as the LAAS!

Learn more by following this link: http://smile.amazon.com/

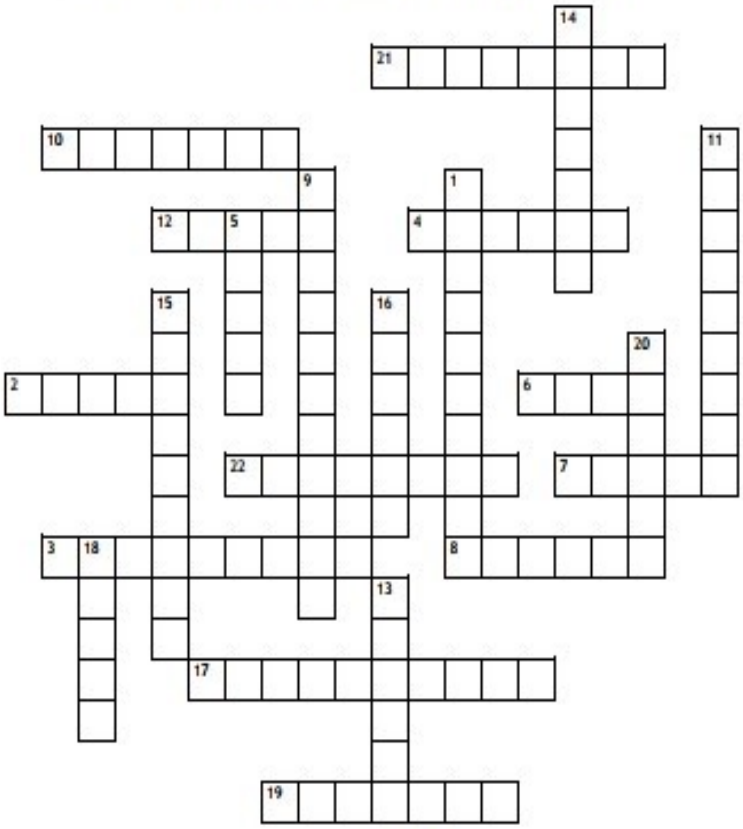
Disclaimer: The Los Angeles Astronomical Society, Inc. is a public charity, as defined by Internal Revenue Code Section 501(c)(3) and all contributions to the Society are deductible for Federal and State Income tax purposes. **The Society does not endorse Amazon.com or any of its business practices**, but we are registered with Amazon Smile and will accept contributions from that program. If you are an Amazon customer and would like to have part of the proceeds from your purchase retuned to the Society as a contribution, please go to https://smile.amazon.com/ when you are shopping on Amazon and select Los Angeles Astronomical Society under the caption: "Or pick your own charitable organization." A percentage of you purchases will be donated to the Society to fund its educational and outreach programs.

John O'Bryan, Jr./Treasurer

Thank you for your donation!

CROSSWORD PUZZLE

Constellations Crossword



Across

2 Hunting for stars
3 A tail with a sting
4 El torro
6 The Harp
7 The Ram
8 The Eagle
10 A Medusa Fan
12 Might be a water mocassin
17 Might have been a mastiff
19 Not aimed at any apple in the sky!
21 A little gallop and go
22 Muscles galore!

Down

1 The Queen of the sky
5 A fire breathing flying beast
9 The Goat
11 And they called him, "Flipper."
13 Tea for two
14 Married to the Queen
15 No saddle needed
16 Cawing for attention
18 Release the Kraken!
20 Don't let it touch bottom!

This is a printable puzzle created just for the LAAS.

Club Contacts

Club Contact Information

President: Geovanni Somoza

geovanni_somoza@hotmail.com

Vice President: Tim Thompson

timthompson3@verizon.net

Treasurer: John O'Bryan, Jr.

Treasurer@laas.org

Secretary: Spencer Soohoo

Secretary@laas.org

Outreach Coordinator: Heven Renteria

outreach@laas.org

Youth Coordinator: James Rochford

jcrochford@gmail.com

Webmaster: Steve Dashiell

Webmaster@laas.org

Club Communications: Andee Sherwood

Communications@laas.org

Mt. Wilson Coordinator: Darrell Dooley

mtwilsoncoordinator@laas.org

Loaner Program: Dave Sovereign

626-794-0646

Bulletin Editor: Andee Sherwood

communications@laas.org

Club Phone Numbers

LAAS Message Phone:

213- 673-7355 - Checked daily

Griffith Observatory:

213-473-0800

Sky Report:

213-473-0880

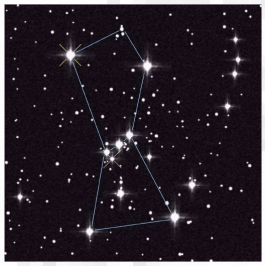
Lockwood Site:

661-245-2106

Not answered, arrange time with caller.

Outgoing calls – Collect or calling card only.

Click on one of the images below to view hyperlinks attached with information about astronomy and for fun.



Night Sky Network

Find us on Facebook

twitter

YouTube

Instagram

Contact Us
The Los Angeles Astronomical Society
2800 E. Observatory Road
Los Angeles, CA 90027

Call us for more information about our organization and outreach program.
213-673-7355

Visit our web site at
www.LAAS.org

From:
The Los Angeles Astronomical Society (LAAS)
c/o Griffith Observatory
2800 E. Observatory Road
Los Angeles, CA. 90027

PLACE STAMP HERE

To: