



THE LOS ANGELES ASTRONOMICAL SOCIETY

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THE BULLETIN



VM31 Andromeda galaxy 2.5 million lyrs away n full glory!

"Here is the most detailed image of M31 - Andromeda galaxy photographed by me. I have imaged this from several dark locations before but this one is from my backyard (bortle8+ skies). Given enough exposure time it is possibel to over come terrible light pollution!" - Nasir Jeevanjee

Filters: RGB and Halpha—Total Integration time: 18 hours.—Software: Pixinsight.

Photo credit: Nasir Jeevanjee

Upcoming Virtual Club Events

Dark Sky Night: Dec. 4, 2021

Board Meeting; Dec. 8, 2021

General Meeting; Dec. 13, 2021

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All members are encouraged to contribute articles of interest for publication in The Bulletin.

Please send your articles and images to:

communications@laas.org

Update Your Contact Information

Please send any contact info changes to the club secretary at

secretary@laas.org.

News - The Garvey Ranch Park Observatory

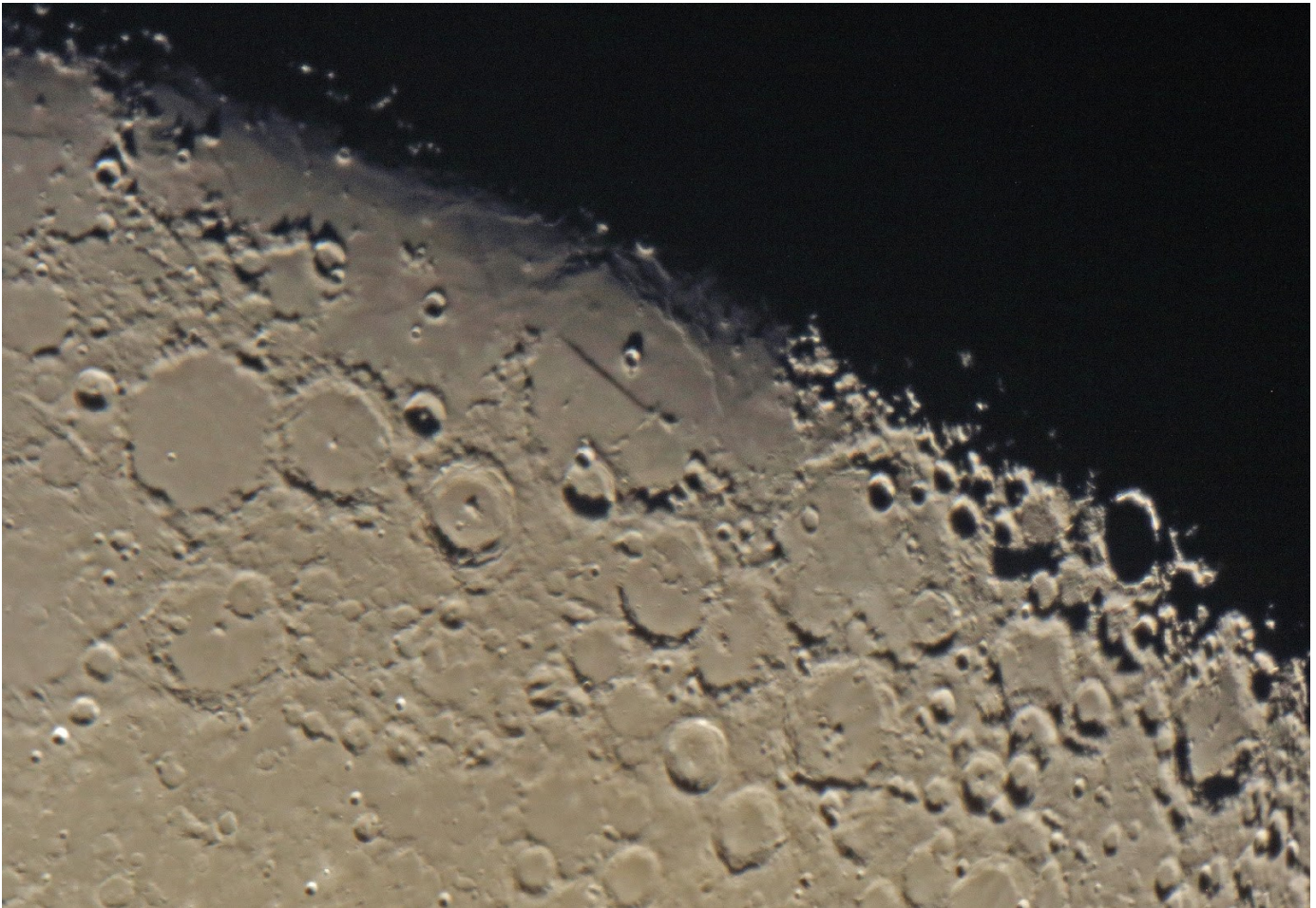
Garvey Ranch Observatory will be open **only** to fully vaccinated members with proof of vaccination. Masks are required at all times, indoors and outdoors.

Straight Wall - Waxing and Waning

By Ray Blumhorst

Rupes Recta is arguably one of the most notable features on the moon. It is more commonly known as Straight Wall. Strait Wall is an escarpment, or drop off in the Mare Nubium region of the lunar surface. Its measurements are roughly: 68 miles long, 1.5 miles wide, and 300 yards high. Although Straight Wall appears to be a sheer drop off from our perspective here on Earth, it's really a gradual slope of 7.5 degrees inclination that could very easily be climbed if here on Earth. Of course, on the Moon, a bulky space suit would make climbing it more challenging.

During the first quarter of the month, when the lunar cycle is waxing, Straight Wall is near the terminator line and casts a long shadow over its full length. It looks like a long black line.



First quarter Straight Wall

During the last quarter of the month, when the lunar cycle is waning, it is again near the terminator line and its slope is illuminated in bright sunlight. It looks like a long white line.



Last quarter Straight Wall

Straight Wall is located in Mare Nubium near its edge. Mare Nubium is one of the Moon's prominent, solidified lava seas that formed from ancient lava flows. Straight Wall is believed to have been created by changes in the surface tension of the lava as the hot lava of Mare Nubium cooled, solidified and pulled apart, according to "New Atlas of the Moon," Thierry Legault and Serge Brunier, Firefy Books, 2006.

Some sources say meteor impact shock waves such as the one that formed Mare Imbrium may have also contributed to the formation of Straight Wall, but there does not appear to be a consensus on all the factors that helped to form Straight Wall.

Visibly close to Straight Wall is the impact crater Brit. Brit is above Straight Wall and located at approximately the mid point of its length. The area in Mare Nubium on the Brit crater side of Straight Wall is where the massive subsidence occurred that gives Straight Wall its offsets in elevation.

Additionally, numerous older crater formations can be seen underlying the cooled and solidified lava of Mare Nubium.

Although the Moon has been billions of years in the making, I was unable to find an estimation of the age of Straight Wall, nor can I even imagine how the age of a lunar landslide/moonquake might be dated. In my lifetime, space exploration has revealed much that was previously unknown, and has answered many questions previously unanswered, but along the way it seems to have presented us with as much, or more, to wonder about. With new opportunities for lunar exploration in the coming decades many more mysteries of the Moon should shine forth.

Photo credit: Ray Blumhorst

The James Webb Space Telescope: Ready for Launch!

By Dave Prosper

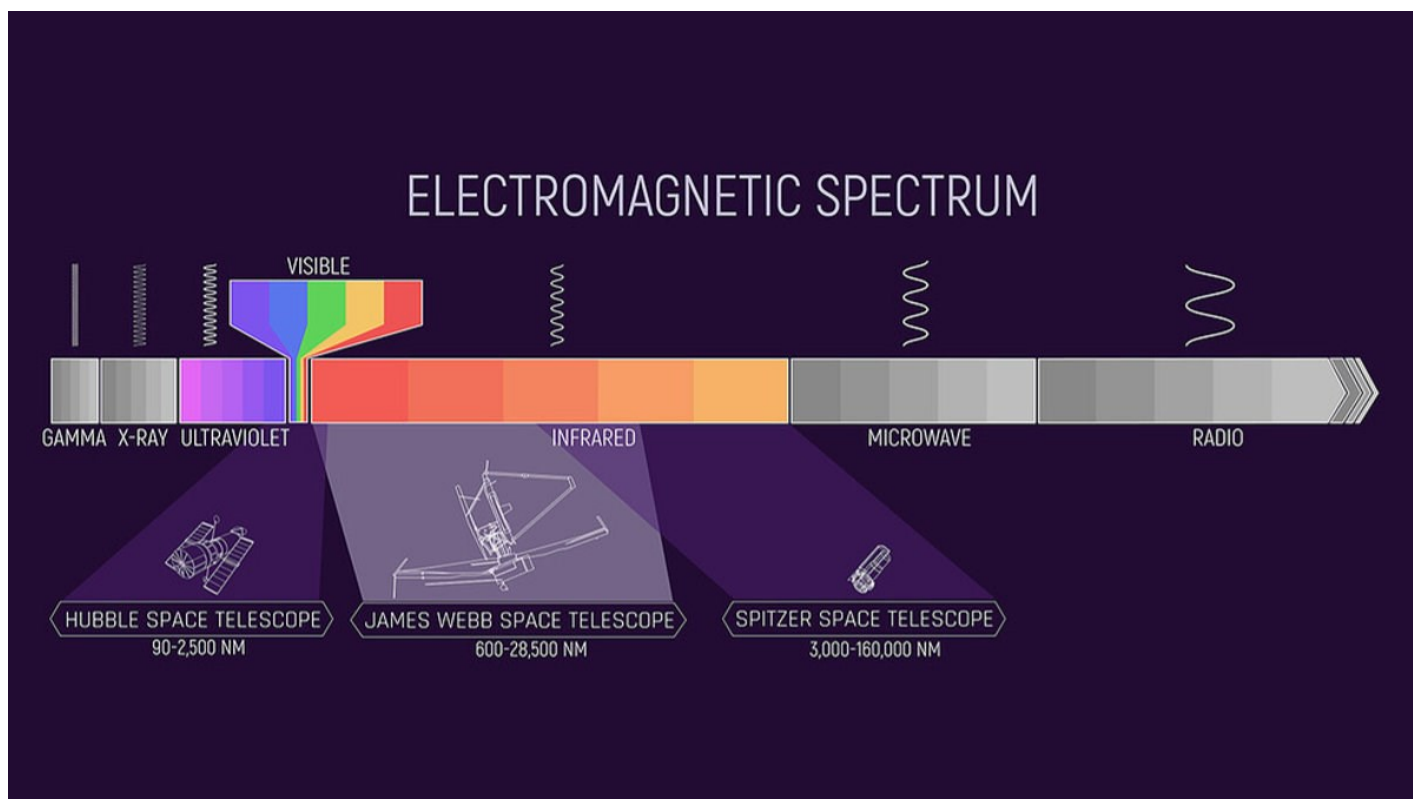
NASA's James Webb Space Telescope is ready for lift-off! As of this writing (November 15), the much-anticipated next-generation space telescope is being carefully prepared for launch on December 18, 2021, and will begin its mission to investigate some of the deepest mysteries of our universe.

The development of the Webb began earlier than you might expect – the concept that would develop into Webb was proposed even before the launch of the Hubble in the late 1980s! Since then, its design underwent many refinements, and the telescope experienced a series of delays during construction and testing. While frustrating, the team needs to ensure that this extremely complex and advanced scientific instrument is successfully launched and deployed. The Webb team can't take any chances; unlike the Hubble, orbiting at an astronaut-serviceable 340 miles (347 km) above Earth, the Webb will orbit about one million miles away (or 1.6 million km), at Lagrange Point 2. Lagrange Points are special positions where the gravitational influence between two different bodies, like the Sun and Earth, "balance out," allowing objects like space telescopes to be placed into stable long-term orbits, requiring only minor adjustments - saving Webb a good deal of fuel.

Since this position is also several times further than the Moon, Webb's sunshield will safely cover the Moon, Earth, and Sun and block any potential interference from their own infrared radiation. Even the seemingly small amount of heat from the surfaces of the Earth and Moon would interfere with Webb's extraordinarily sensitive infrared observations of our universe if left unblocked. More detailed information about Webb's orbit can be found at bit.ly/webborbitinfo, and a video showing its movement at bit.ly/webborbitvideo.

Once in its final position, its sunshield and mirror fully deployed and instruments checked out, Webb will begin observing! Webb's 21-foot segmented mirror will be trained on targets as fine and varied as planets, moons, and distant objects in our outer Solar System, active centers of galaxies, and some of the most distant stars and galaxies in our universe: objects that may be some of the first luminous objects formed after the Big Bang! Webb will join with other observatories to study black holes - including the one lurking in the center of our galaxy, and will study solar systems around other stars, including planetary atmospheres, to investigate their potential for hosting life.

Wondering how Webb's infrared observations can reveal what visible light cannot? The "Universe in a Different Light" Night Sky Network activity can help - find it at bit.ly/different-light-nsn. Find the latest news from NASA and Webb team as it begins its mission by following #UnfoldTheUniverse on social media, and on the web at nasa.gov/webb.



Webb will observe a wide band of the infrared spectrum, including parts observed by the Hubble - which also observes in a bit of ultraviolet light as well as visible - and the recently retired Spitzer Space Telescope. Webb will even observe parts of the infrared spectrum not seen by either of these missions! Credits: NASA and J. Olmstead (STScI)



This article is distributed by NASA Night Sky Network

The Night Sky Network program supports astronomy clubs across the USA dedicated to astronomy outreach. Visit nightsky.jpl.nasa.gov to find local clubs, events, and more!

NSN Webinar Series:

Postcards From the Universe

Join the NASA Night Sky Network on **Tuesday, December 7** at 6:00pm Pacific Time (9:00pm Eastern) to hear **Dr. Jerry Bonnell from NASA's Astronomy Picture of the Day** bring us the best of APOD for 2021.

Along with Robert Nemiroff, Jerry Bonnell has written, coordinated, and edited NASA's [Astronomy Picture of the Day](#) (APOD) since 1995. The [APOD archive](#) contains the largest collection of annotated astronomical images on the internet.

About Jerry Bonnell

Dr. Jerry Bonnell received a Ph.D. in astronomy from the University of Maryland at some point during the last century. He has since enjoyed working on a variety of astrophysical satellite projects at NASA's Goddard Space Flight Center including the Cosmic Background Explorer, the International Ultraviolet Explorer, the Compton Gamma Ray Observatory, and the Fermi Gamma-ray Space Telescope. While his research interests have wandered across the entire electromagnetic spectrum they have most recently focused on the time histories and spectral evolution of cosmic gamma-ray bursts.

Author of popular books, reviews, and magazine articles on astronomy and high-energy astrophysics, Dr. Bonnell is also a founding editor and author of the Astronomy Picture of the Day (APOD), begun in 1995. Dr. Bonnell lives with his wife (an art historian) in Greenbelt, MD, USA.

His presentation "Postcards from the Universe" will look back on favorite astronomy and night sky images featured on APOD during 2021.



Registration and Additional information for Members:

Night Sky Network members can join live, ask questions, and get up-to-date information about the resource. Members may register in advance for this webinar (*login required*) on the [Outreach Resource page](#).

Public Viewing Options:

The event will stream live on YouTube.

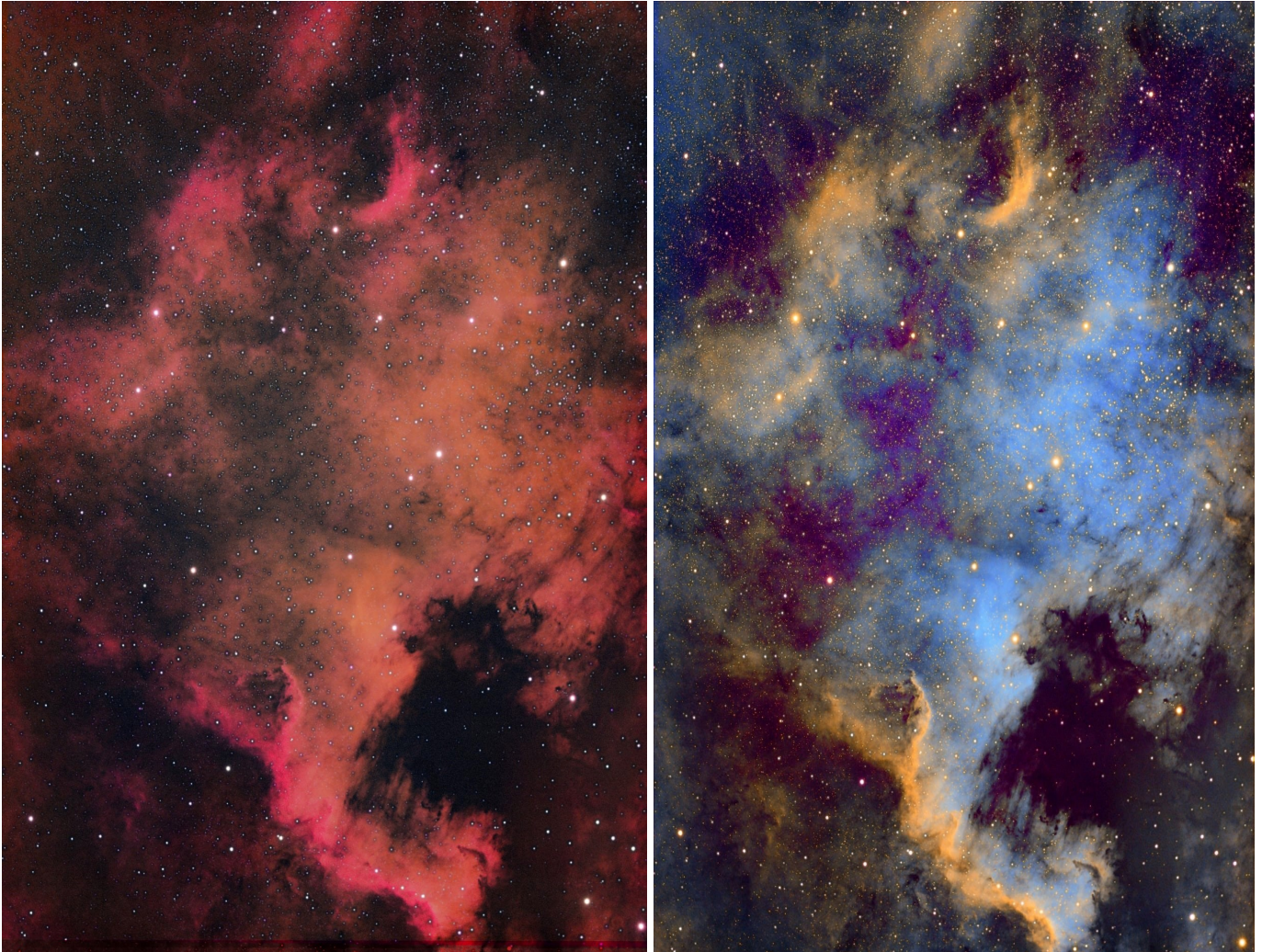
Link: <https://youtu.be/nURSCNTBZI8>

After the event, this recording will join past webinars featuring NASA Speakers on the [NSN YouTube](#) page.

[Click here to see a list of previous webinars](#)

The North American Nebula - NGC 7000

By Nasir Jeevanjee



North American Nebula (NGC 7000, 2600 lyrs) imaged from my backyard (Bortle 8+). Apparent size in the sky is big! Almost equal to 18 full moons!

ZWOASI 1600, 80 mm Stellarvue, GEM45G ioptron mount.

Total exposure time about 12 hrs for 3 narrow band filters for 4 hours each. It is my longest exposed image ever!

Processed with two different color palettes. Left one is more natural color and right is Hubble palette.

Photo credit: Nasir Jeevanjee

Monthly Sky Report

By Dave Nakamoto

The **Geminid meteor shower** always produces a good show of 20 to 40 meteors an hour during its peak, which this year starts in the evening of the 13th and through to the morning of the 14th. A dark sky will be needed away from all man-made lights, but the waxing gibbous moon will also interfere with observing the meteors this year. These meteors are slow moving with frequent bright ones.

And now for the planets, in the order they appear from the evening to the morning sky.

Mercury is too close to the sun until the very end of December, when it sets at 6:07 p.m., PST, and the sun sets at 4:54 p.m., PST. Do not observe any planet when the sun is in the sky, for the danger to the eyes is great.

Venus ends its long visitation to our evening sky this month, sinking towards the horizon low in the southwest. Venus appears as a thin crescent during this month, the crescent increasing to 39 arcseconds tall but barely one arcsecond wide. Venus sets one hour after the sun does on the 31st. Do not observe any planet when the sun is in the sky, for the danger to the eyes is great.

Saturn is low in the southwest in the evening sky. The planet sets at 9:03 p.m., PST, on the 1st and at 7:19 p.m., PST, on the 31st.

Jupiter is the very bright star to the east of Saturn. Jupiter sets at 10:23 p.m., PST, on the 1st and at 8:50 p.m., PST, on the 31st.

Mars starts to rise in the morning sky, but is too close and too far away, presenting a very small disk, and so nothing can be seen on its disk even through large telescopes.

Neptune is tougher to find because it is much fainter than Uranus at mag. +7.9, approximately six times fainter, and much smaller with a disk only 2.3 arcseconds wide. It is in the constellation Aquarius the Water Bearer. On the 15th, Neptune is at Right Ascension 23h 25m 38s with a declination of $-4^{\circ} 56' 51''$.

Uranus is at mag +5.7 in the constellation Aries the Ram. It is available for observation almost all night long. On the 15th, Uranus is at Right Ascension 2h 34m 47s with a declination of $+14^{\circ} 43' 47''$. The planet is only 3.8 arcseconds wide, so you'll need a telescope with a magnification of 150x to see its diminutive disk.

For both Uranus and Neptune, you might recognize them even if you don't see a disk by remembering the following. Both planets will be an unusual greyish green color, although the color will be pale. They also will not twinkle as the stars do. Finally, even at low magnifications, you might get the impression that they are not pinpoints of light.

The Moon is new on the 3rd, at first quarter on the 10th, is full on the 18th, and at last quarter on the 26th.

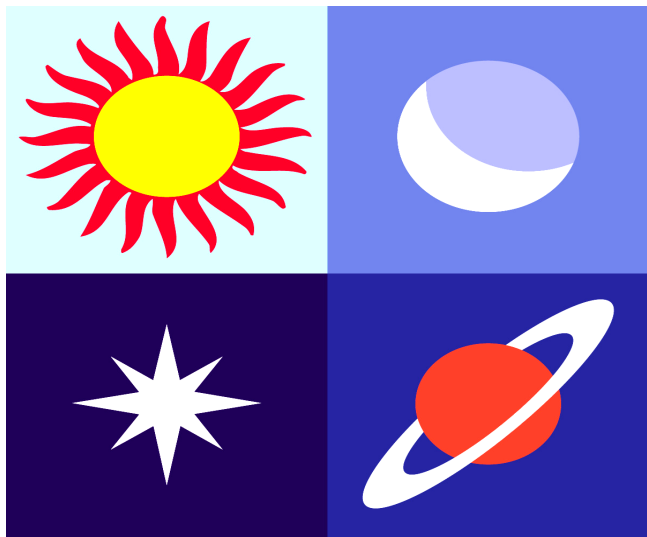
Comet Leonard C/2021 A1 might be visible through binoculars or even with the unaided eye. Discovered by Greg Leonard of the University of Arizona, the comet might be first visible on the 11th. The sun sets at 4:44 p.m., PST, and Leonard sets at 5:27 p.m., PST, 43 minutes later and is very low towards the west northwest. One day later, on the 12th, Leonard will be closest to the earth at a distance of 21,690,000 miles. It will be nine degrees south of where it was on the 11th, and probably at its brightest. On the 14th, the comet is directly above where the sun sets. Sunset is at 4:45 p.m., PST, while Leonard sets at 6:04 p.m., PST, one hour and 19 minutes later. The comet continues to move toward the southwest and rises slightly higher each night. On the 31st, the comet is low in the south-southwest and sets at 6:53 p.m., PST, and the sun sets at 4:54 p.m., PST. Leonard's predicted celestial coordinates are listed in the table below. Azimuth and elevation are at sunset. An azimuth of 270° is directly west.

Date R.A. Dec Azimuth Elevation

11 16h 51m $+1^{\circ} 20'$ 266° WSW 7°

David Nakamoto has been observing the heavens through various scopes since he was in the 5th grade. You can contact Dave by email at: dinakamoto@hotmail.com.





Almanac

December 4 - New Moon. The Moon will be located on the same side of the Earth as the Sun and will not be visible in the night sky. This phase occurs at 07:44 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.

December 4- Total Solar Eclipse. A total solar eclipse occurs when the moon completely blocks the Sun, revealing the Sun's beautiful outer atmosphere known as the corona. The path of totality will for this eclipse will be limited to Antarctica and the southern Atlantic Ocean. A partial eclipse will be visible throughout much of South Africa. ([NASA Map and Eclipse Information](#) [Interactive NASA Google](#))

December 13, 14 - Geminids Meteor Shower. The Geminids is the king of the meteor showers. It is considered by many to be the best shower in the heavens, producing up to 120 multi-colored meteors per hour at its peak. It is produced by debris left behind by an asteroid known as 3200 Phaethon, which was discovered in 1982. The shower runs annually from December 7-17. It peaks this year on the night of the 13th and morning of the 14th. The waxing gibbous moon will block out most of the fainter meteors this year. But the Geminids are so numerous and bright that this could still be a good show. Best viewing will be from a dark location after midnight. Meteors will radiate from the constellation Gemini, but can appear anywhere in the sky..

December 19 - Full Moon. The Moon will be located on the opposite side of the Earth as the Sun and its face will be fully illuminated. This phase occurs at 04:37 UTC. This full moon was known by early Native American tribes as the Cold Moon because this is the time of year when the cold winter air settles in and the nights become long and dark. This moon has also been known as the Long Nights Moon and the Moon Before Yule.

December 21 - December Solstice. The December solstice occurs at 15:50 UTC. The South Pole of the earth will be tilted toward the Sun, which will have reached its southernmost position in the sky and will be directly over the Tropic of Capricorn at 23.44 degrees south latitude. This is the first day of winter (winter solstice) in the Northern Hemisphere and the first day of summer (summer solstice) in the Southern Hemisphere.

December 21, 22 - Ursids Meteor Shower. The Ursids is a minor meteor shower producing about 5-10 meteors per hour. It is produced by dust grains left behind by comet Tuttle, which was first discovered in 1790. The shower runs annually from December 17-25. It peaks this year on the the night of the 21st and morning of the 22nd. The nearly full moon will be a problem this year, blocking all but the brightest meteors. But if you are patient enough, 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 Ursa Minor, but can appear anywhere in the sky.



Source:

<http://www.seasky.org/astronomy/astronomy-calendar-2021.html>





December 2021

Sun	Mon	Tue	Wed	Thu	Fri	Sat
<p>Nov. 28- Dec. 6th</p> 			1	2	3	4 Dark Sky Night
5	6	7 NSN Webinar 6PM	8 Board Meeting	9	10	11
12	13 General Meeting	14	15	16	17	18
19	20	21	22	23	24	25 
26	27	28	29	30	31 Happy New Year!	



Meet The New Members

Welcome to the LAAS!



Fausto Rodriguez

Paul O'Berry

Drew Aresca

Marvin Avila-Salmon

LAAS Board Meetings

.Due to the pandemic, all Board Meetings are now held online, live on Zoom. Please check the information posted in the IO Group Forum for any current news related to these meetings. If you wish to attend a board meeting, please send a request to secretary@laas.org for a link to Zoom.

Volunteer Opportunities

Every LAAS member is a volunteer at some point. Some members volunteer to share telescopes with the public, while others tackle administrative duties, help out at our community and public events, or join a club committee. Taking photos at our events and writing articles about events for our club newsletter are great ways to volunteer and become more involved in the LAAS as a member.

HOWEVER, due to Covid-19 restrictions in our area, all outreach events have been cancelled until further notice.

Volunteers are always welcome to write articles for our monthly newsletter or share images captured of the night sky. Members are also welcome to come up with new ideas and future activities for the membership which can be shared in Board meetings. If you are artistic and enjoy creating posters or flyers, or printable astro-educational handouts for further star parties, please let us know.

Time To Renew Your Membership?

Please remember to renew your membership once you receive notice from the Club Secretary in your email inbox.

Please send any new contact information to the club secretary at secretary@LAAS.org.



LAAS Outreach Program

The mission of LAAS is to promote interest in and advance the knowledge of astronomy, optics, telescope making and related subjects. In furtherance of its mission, LAAS conducts public star parties and other outreach events that are intended to enhance the public's understanding of astronomy and its enjoyment and appreciation of the beauty and wonders of our universe.



We provide outreach events at local schools, Griffith Observatory, Mt. Wilson Observatory, various state and county parks, and community events.

Join our Outreach team of volunteers today.

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



Want to include astronomy outreach at your school's science night or open house? Follow the link below to access the request form:

https://nightsky.jpl.nasa.gov/club-eventrequest.cfm?Club_ID=1344

LAAS Club Swag

LAAS T-SHIRTS, HOODIES, MUGS, AND MORE!

To find new merchandise from our store, please use the following link: <https://www.laas.org/store>

Please note all prices listed are subject to change and include all shipping and handling costs. All items will be shipped directly to the address you provide on your order form.



Please remember all LAAS Outreach activities are postponed due to the Covid-19 pandemic.

Amazon Smiles

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/>



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John O'Bryan, Jr.

Treasurer

Astronomy Magazine Discounts

Discounts for astronomy magazines can be found on the internet. Look for the best deals possible. Send a copy of your LAAS membership card with your check or payment to receive a club member discount.

Astronomy
magazine

As a member of the Night Sky Network, you may use the above link to renew your Astronomy Magazine subscription (or enter a new subscription) at the club discount rate. If this is a renewal, Astronomy Magazine will match your entered name and address and extend your subscription. For inquiries, please contact Astronomy Magazine customer service & sales at 1-800-533-6644.

[Click here to subscribe to Sky and Telescope Magazine.](#)



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<http://stardate.org/store/subscribe>
Then, on the Checkout form, enter "network" in the Coupon Code box.



Club Contact Information

President: Curtis Byrom

Cbyrom484@yahoo.com

Vice President: Alecia Hurst

hurst.alecia@gmail.com

Treasurer: John O'Bryan, Jr.

treasurer@laas.org

Secretary: Spencer Soohoo

secretary@laas.org

Outreach Coordinator: Heven Renteria

outreach@laas.org

Club Communications: Andee Sherwood

communications@laas.org

Mt. Wilson Coordinator: Darrell Dooley

mtwilsoncoordinator@laas.org

Bulletin Editor: Andee Sherwood

communications@laas.org

Club Contacts

Club Phone Numbers

LAAS Message Phone:

213- 673-7355 (Checked daily)

Griffith Observatory:

213-473-0800

Sky Report:

213-473-0880



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visiting NASA's Night Sky Network:

<https://nightsky.jpl.nasa.gov/about.cfm>