

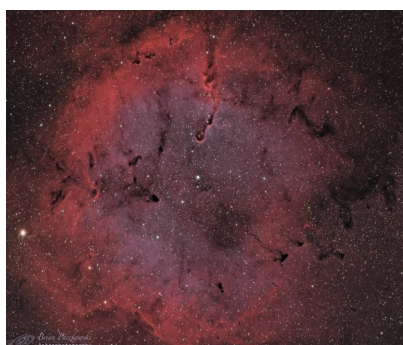


THE LOS ANGELES ASTRONOMICAL SOCIETY

THE BULLETIN

JULY, 2021

VOLUME 95, ISSUE 07



Elephant's Trunk Nebula (IC 1396). This star forming region of interstellar gas and dust is located about 2,400 light years from Earth in the constellation Cepheus. There are 2 different composite images, the first using the Hubble palette and the second image is a more "natural" palette. A total of 30 hours of data is used to create these composites.

Photo Credit: Brian Paczkowski

June 20, 2021

Upcoming Virtual Club Events

Board Meeting; July 7, 2021

General Meeting; July 12, 2021

Dark Sky Night—July 10, 2021

The LAAS has scheduled a few nights for members only at the Ford Observatory in July.

Please go to the bottom of Page 2 to find out how you can view the dates for these special observing (and fun) nights.

In This Issue

| | |
|---|-------------|
| Mountaineer Days | Page 2 |
| Astronomy Nights/Hubert Eaton | Pages 3-4 |
| Mt. Wilson 60 Inch Nights | Page 5 |
| NSN Webinar | Page 6 |
| The Depths Of the Star..... | Pages 7-9 |
| Building An All Sky Camera | Pages 10-13 |
| The End of Night | Pages 14-16 |
| Monthly Sky Report | Page 17 |
| Almanac | Page 18 |
| Calendar of Events | Page 19 |
| Meet the New Members | Page 20 |
| The LAAS Outreach & Club Swag | Page 21 |
| Amazon Smiles & Astro Magazines | Page 22 |
| Club Contacts & Social Media Link | Page 23 |

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.

Mountaineer Days - Wrightwood, CA

By Curtis Byrom

Mountaineer Days July 10-11, 2021 Wrightwood, CA

The town on Wrightwood is welcoming back Mountaineer Days this year on the weekend following Independence Day.

Mountaineer Days is a 2 day fun filled family event that highlights the history of the area.

It will be held on July 10-11 in the downtown area of Wrightwood.

The LAAS Ford Committee decided this year to set up a booth at the event to promote astronomy and introduce LAAS to local residents, since Ford Observatory only 7 miles from town.

We are planning to have a couple of solar telescopes set up, hand out some brochures, offer some small astronomy related items for sale.

Contact Information:

Curtis Byrom: cbyrom484@yahoo.com

Joe Phipps: jofishr@yahoo.com

For general information about this event or to find lodging, dining, and directions, please visit the following website:

<https://www.wrightwoodchamber.org/annual-events>

Editor's Note:

Curtis has scheduled some sessions at the Ford Observatory during the month of July. These events are for members only and can be found on our calendar. You will be able to view these events ONLY after logging in to your account as they are listed as private events.

Follow this link to login:

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

WRIGHTWOOD
MOUNTAINEER DAYS
JULY 10th - 11th, 2021

Unique Local Shops & Eateries,
Old Time Games & Contests,
Quilt Auction,
Petting Zoo & Pony Rides,
Specialty Vendors,
Cowboys & Gunfighters,
Raffles, Hometown Parade,
Live Music, Beer & Food Garden
10 a.m. - 5 p.m.

FREE ADMISSION
BRING THE WHOLE FAMILY!

GENEROUSLY SPONSORED BY:

WRIGHTWOOD CHAMBER OF COMMERCE
MOUNTAIN HIGH
SAN BERNARDINO COUNTY

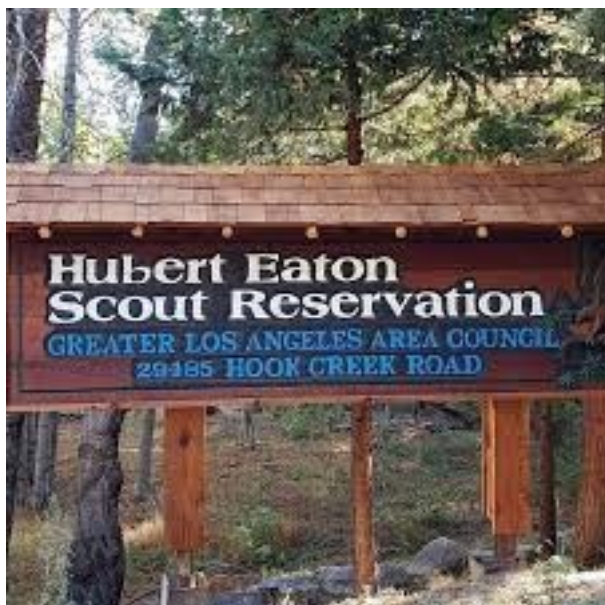
For more information & a full schedule of events visit: www.wrightwoodchamber.org

POSTER ART BY VINCENT J. NABAK - VINCENTARTBYWOOD.COM

Astronomy Nights at Hubert Eaton Scout Reservation

Reservation

By Carolyn Thompson



Up in the local mountains, near Lake Arrowhead, sits Hubert Eaton Scout Reservation, the campground owned and operated by the Greater Los Angeles Area Council of the Boy Scouts of America. LAAS family members, Greg & Carolyn Thompson, had planned to try to get the club involved with the Boy Scout camp, bringing a couple volunteers each week for the camp's Astronomy Nights. And then the COVID shutdown happened, cancelling all gatherings for the Scouts for 2020.

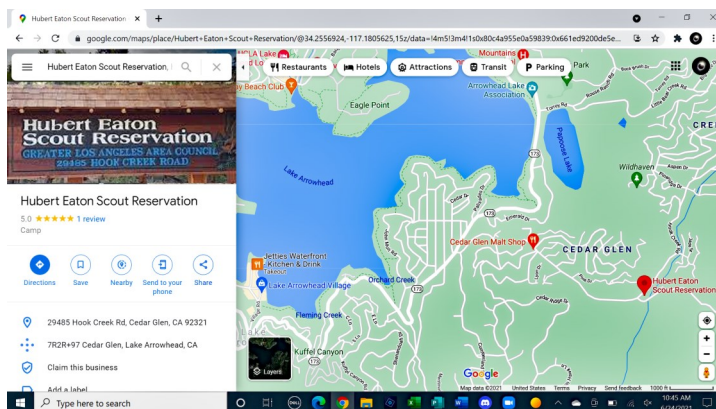
Well, it's 2021. Restrictions have been lifted. And Summer Camp is in full swing at Hubert Eaton Scout Reservation through July 31st. Astronomy Night star parties are being held on Tuesday nights, unless the weather doesn't cooperate, in which case they're rescheduled for Thursday nights. Boy Scout Summer Camp runs the whole week for the Scouts (which includes girls as well as boys now). So each Tuesday or Thursday will have a new crop of Scouts wanting to look through the telescopes at that particular week's star party.

Very visible sign for the road into Hubert Eaton Scout Reservation on Hook Creek Road.

To get directions to the Boy Scout Camp, google "Hubert Eaton Scout Reservation" in Google Maps. Once you turn into the Camp, it will be a fairly long up and down narrow mountain roads, past Camp Pollack, the Cub Scout camp site, to Camp Big Horn at Circle X Ranch, the name of the Boy Scout camp site. Look for the signs to the Observatory before you get to the main camping area of Camp Big Horn.

Volunteers will want to set up telescopes at 7 pm on the cement "landing pad" downhill from the Astronomy classroom and observatory mini-dome. If overnight accommodations are needed, beds can be made available at the cabins at Camp Pollack. Bring your own sleeping bag or bed linens and a pillow, plus toiletries. If meals are needed, dinner is served at the Mess Hall in Camp Big Horn at 6:30 pm and breakfast at 7:45 am. Or you can dine at any of the restaurants open at Lake Arrowhead Village nearby.

Screen Shot of a Google Maps search for Hubert Eaton Scout Reservation. To get directions to the Scout Camp, Google "Hubert Eaton Scout Reservation". There's a trick to staying on Hook Creek Road right after the turn off to get onto it. Google notes that in their directions.



On a good night, you can see the Milky Way over Camp Big Horn at Circle X Ranch's observatory.



The Camp could use a couple volunteers each week to bring their telescopes and set up for their Astronomy Nights star parties. If you wish to help out with this outreach event,

RSVP to Carolyn Thompson atcarolyn@themoneychangers.com

Let me know what weeks are available for you. I will coordinate a schedule of volunteers.

On the morning before you head up to the Scout Camp, call or text the STEM program director, Michael Grow, at 909-907-4769. Reception is spotty at the Boy Scout Camp, so if you have to leave a message when you call, follow up with a text, stating your name, affiliation with LAAS, and interest in bringing a telescope to the star party on Tuesday (or Thursday, if the Tuesday event was canceled).

Carolyn Thompson

LAAS Family Member & BSA Volunteer



The "observatory" is a mini-dome just big enough for one person and a small Schmidt-Cassegrain telescope. Up the hill from the dome is the Astronomy classroom. Down the hill from the dome is the cement "landing pad" where you can set up your telescope. There is a sign on the road indicating the left turn into the Astronomy Observatory after passing Camp Pollack (the Cub Scout camp ground) and before you get to the Mess Hall and tents at Circle X Ranch (the Boy Scout camp ground).

60 Inch Nights Are Back!

Mt. Wilson Observatory!



Session Schedule—2021

Saturday July 3rd –**Booked!**

Saturday August 14th

Saturday September 4th

Saturday October 9th

Saturday November 6th

The dates above are all scheduled on Saturday Nights and are all half-night events.

General Information:

Price per session, per person - \$60.00

There will be 20 people, per session.

Face masks are mandatory until June 15th.

How to Make a Reservation?

Please contact Darrell Dooley **BEFORE** you pay for your reservation.

Darrell is our Mt. Wilson Coordinator and the ONLY contact available.

Darrell's Email Address:

Mtwilsoncoordinator@laas.org

Darrell will answer all of your questions and concerns.

Reserve your spot by paying by credit cards or PayPal using the following link:

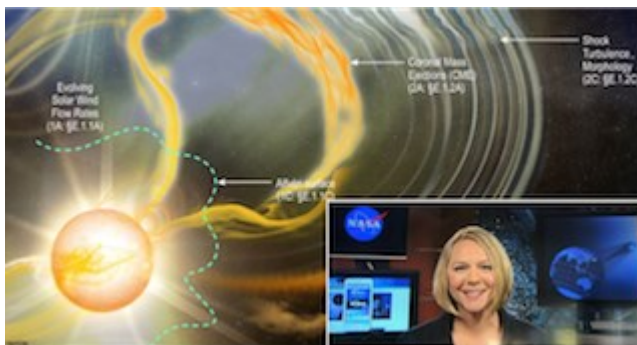
<https://fs30.formsite.com/LAAS/MtWilson/index.html>



Learn more about the 60 Inch Night by visiting Mt. Wilson Observatory's website:

<https://www.mtwilson.edu/60-telescope/>

NSN Webinar Series: The Polarimeter to Unify the Corona and Heliosphere (PUNCH) Mission



Images: NASA / Nicholeen Viall

Date: Tuesday, 7/20/2021

Time: 6:00 PM - 7:00 PM

Join the NASA Night Sky Network on Tuesday, July 20 at 6:00pm Pacific Time (9:00pm Eastern) to hear Dr. Nicholeen Viall give an update on NASA's PUNCH mission to study the Sun's corona.

The Sun's outer atmosphere, the corona, is hundreds of times hotter than the visible surface of the Sun below it. This super-hot coronal plasma (electrons and ions) expands outwards in all directions, accelerating up to millions of miles per hour, carrying part of the Sun's magnetic field with it, and becoming the solar wind. The solar wind fills the solar system, constantly bombarding the planets with plasma and magnetic field. Additionally, the Sun has explosive releases of plasma and magnetic field called coronal mass ejections. These explosions can drive dynamics in Earth's magnetic field, as well as create shocks and accelerate particles that can damage spacecraft and astronauts. The Polarimeter to Unify the Corona and Heliosphere (PUNCH) Mission is a NASA Small Explorer (SMEX) mission to better understand these processes of how the energy of the Sun's corona fills the solar system, and how coronal mass ejections evolve on their way to the Earth and other planets. We will describe the PUNCH mission and how it will answer these fascinating questions about our Sun and space environment.

About Dr. Nicholeen Viall

Dr. Nicholeen Viall is a Research Astrophysicist at NASA's Goddard Space Flight Center, and is the Mission Scientist for the PUNCH mission. She earned her B.S. in Physics and Astronomy from the University of Washington, and earned her PhD in Astronomy from Boston University. She is the 2018 winner of the Karen Harvey prize from the Solar Physics Division of the American Astronomical Society for a significant contribution to the study of the Sun early in a person's professional career. She was awarded NASA's Early Career Achievement Medal for "fundamental contributions to understanding coronal heating and the slow solar wind and for valuable service to NASA, the science community and the public." She has been a highly visible member of NASA's outreach and media team, including the August 21, 2017 Eclipse, and the Parker Solar Probe launch and first results, with over 70 live shot television interviews.

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/iWkG8jbnK54>

After the event, this recording will join past webinars featuring NASA Speakers on the [NSN YouTube](#) page. [Click here to see a list of all previous webinars](#)

The Depths of the Star at the Center of Our Solar System

By Ray Blumhorst

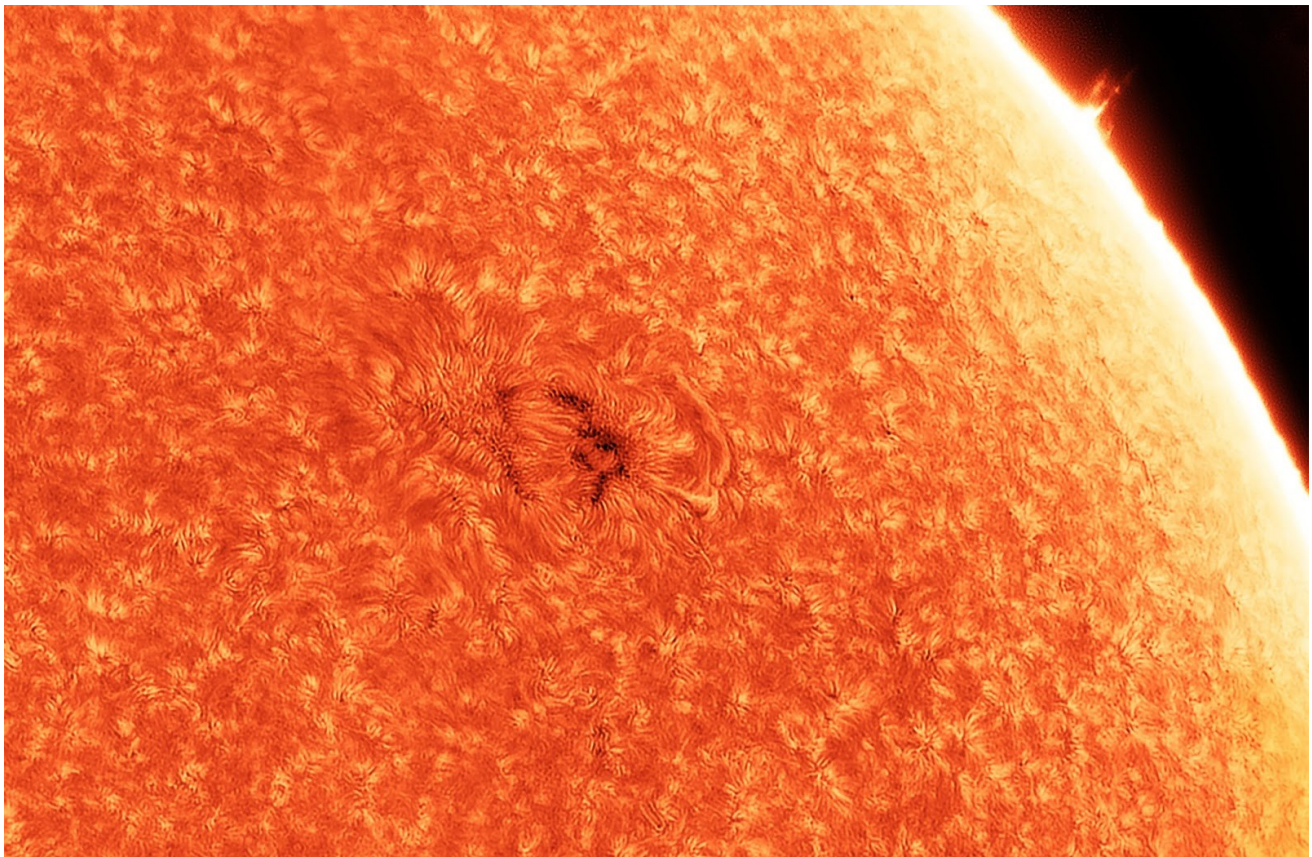
The Sun is Earth's star and has been a source of fascination for curious minds throughout human history, but it's only since the early 20th century that mankind has delved deeper into its profoundest mysteries.

Mount Wilson Solar Observatory was founded in 1904 and subsequently did much to increase our knowledge of the Sun under the guidance of its first director, George Ellery Hale. Almost as fascinating as the discoveries Hale made are the questions that were never answered in his lifetime.

Visual observers and Spectroscopists like Hale studied our Sun as far as the technology of their day could see into the translucent layers of the Sun's atmosphere. Those observable layers of the solar atmosphere are comprised primarily of the photosphere and chromosphere, but Hale also observed and studied the corona when total solar eclipses afforded him the opportunity.

In 1908, Hale used spectroscopy to observe the Zeeman effect through MWO's 60-foot solar tower and in experiments he performed in MWO's laboratory. His research proved the presence of magnetic fields in sunspots. It was the first known magnetic field ever found beyond Earth. For that discovery, Hale was nominated for the Nobel Prize in Physics.

Hale observed the Sun using white light filters, H-alpha filters, and Calcium K filters as evidenced by photos that still hang in the MWO Museum. I don't recall seeing a photo taken in the Sodium line, but may have missed it. Hale never knew what lay deeper in the Sun beyond the photosphere. As stated, it was only the Sun's transparent atmosphere (the photosphere, the chromosphere and the corona), Hale studied. He was just not able to go deeper into the opaque interior with the technology available to him in his time.



Beneath the corona, but above the photosphere, the chromosphere roils in this H-alpha image



In this white light image of the photosphere, a sunspot group moves toward the solar limb, where limb darkening is apparent.

An article in the April 2021 issue of *Sky & Telescope* addresses the ongoing debate between Spectroscopists and Helioseismologists over the extent of metals present in our Sun and their relevance to current solar research. In a nutshell, Spectroscopists identify elements in our Sun by observing their absorption lines through a spectroscope and Helioseismologists study the sound waves of the Sun.

Helioseismologists first observed solar oscillation in the early 1960s, according to Wikipedia. The low pulsing hum is distinctive. Those observations and subsequent ones helped lead to theories we hold today about the Sun's: core, radiative zone, and convection zone.

"The Sun is vibrating at lots of different frequencies," said Alex Young, Associate Director for Science in the Heliophysics Science Division at NASA's Goddard Space Flight Center. "We don't have straightforward ways to look inside the Sun...so using a star or the Sun's natural vibrations allows us to see inside of it," Young said in the CNN article.

<https://www.cnn.com/2018/07/27/us/sun-sounds-nasa-song-space-wxc-trnd/index.html>

Just as Seismologists on Earth track the passage of earthquakes through our planet to study its internal structure, Helioseismologists use our Sun's pulsations to study its composition and structure.

Elements in our Sun that are heavier than Helium are known as metals. The more metals that are present, the more opaque the Sun becomes. By definition "opaqueness" is what blocks seeing into the Sun, and "transparency" is what allows seeing into the Sun. The windows in your home are transparent. The walls are opaque. In the Sun, opaqueness also affects the sound waves that reach the surface, both their pattern and their speed.

"...the Sun hums. Huge flows of material swell and sink under the solar surface, meaning the underbelly of our star is in a constant state of flux. These motions create sound waves that bounce around inside the Sun, with some making it to the photosphere, resulting in an undulating surface that throbs in and out." says Sarbani Basu (Yale University).¹

Helioseismology has allowed us to discover many amazing details about the dynamics of the Sun's deep interior, its: convection zone, radiative zone, and core.

Although Helioseismology remains in the realm of solar astrophysicists, solar filters in: white light, H-alpha, Calcium H, and Sodium are available to amateur astronomers, making this a privileged time for many willing to make the investment. Solar astronomy with a white light filter is even easier as they can easily fit into the budget of the most frugal.

Observing and imaging our Sun reveals many of the wonders that Hale first saw. Such a first hand experience, combined with the written record Hale left behind, opens up a rich realm of historical knowledge about the incredible star at the center of our solar system.

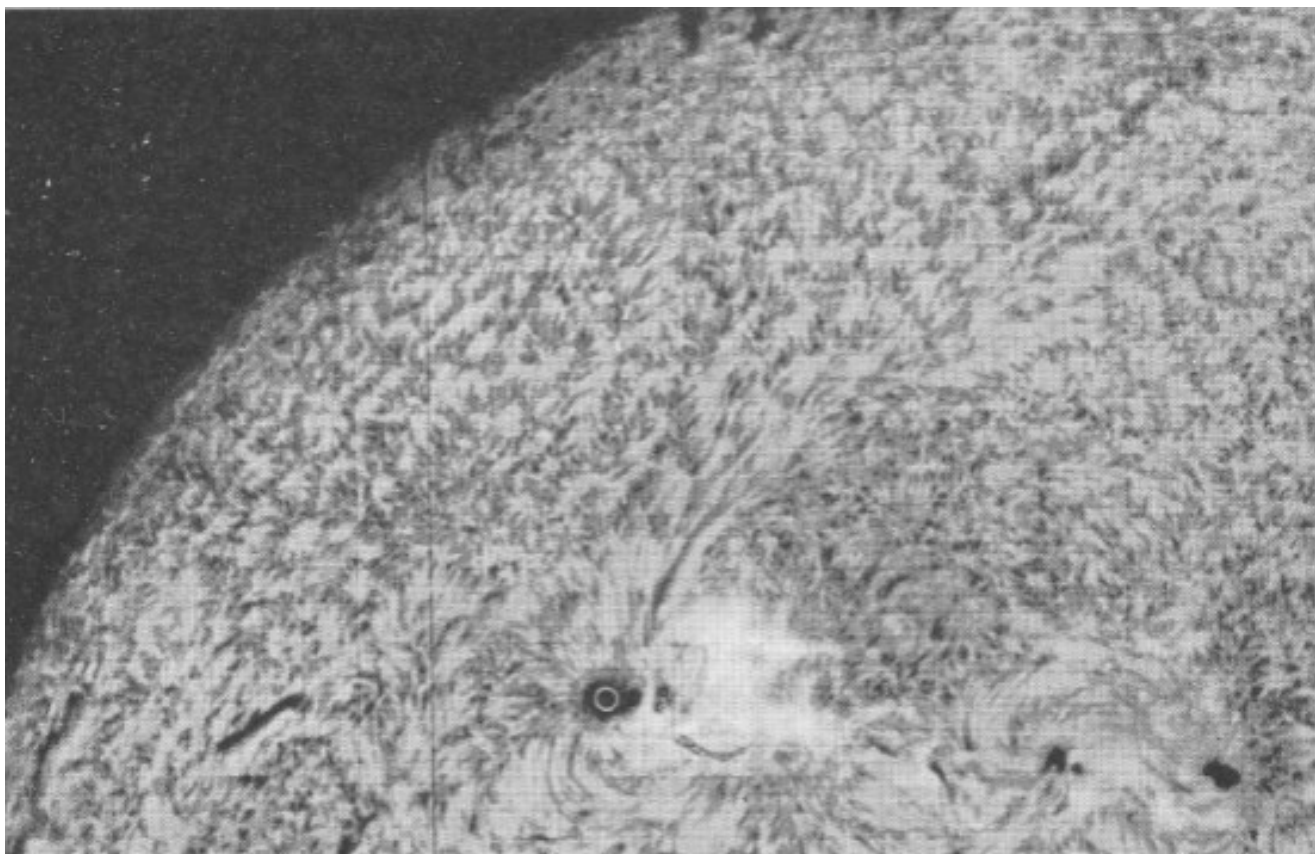


Fig. 22. Photograph of the hydrogen atmosphere of the Sun. (Ellerman)

Made with the spectroheliograph, showing the immense vortices, or whirling storms, like tornados that centre in sun-spots.

The comparative size of the earth is shown by the white circle traced on the largest sun-spot.

¹ Sky & Telescope, April 2021, How Well Do We Know the Sun, Pp.12, Colin Stuart, ColinStuart@SkyPonder, ColinStuart.net/newsletter

² Fig. 22, The New Heavens, George Ellery Halle, 1922, Charles's Scribner Sons (Now in Public Domain)

Building an All Sky Camera

By Spencer L. SooHoo



One-minute exposure from the all sky camera showing moonrise, the Milky Way, and a meteor .

The orientation is what you would see if you were lying on your back with your head pointed North. East is on the left, West is on the right, and South is at the bottom.

When we got satellite Internet at the LAAS Lockwood facility (SKAS) in September 2018, I wanted to install an all sky camera there. Reasons include:

- See what the daytime sky looks like at Lockwood before making the drive up there

- See if clouds are overhead during the night during an observing session

- Capture images of meteors and satellites

- See the progression of the stars over the course of the night

- Capture a time-lapse of the Milky Way as it rises in the East and sets in the West

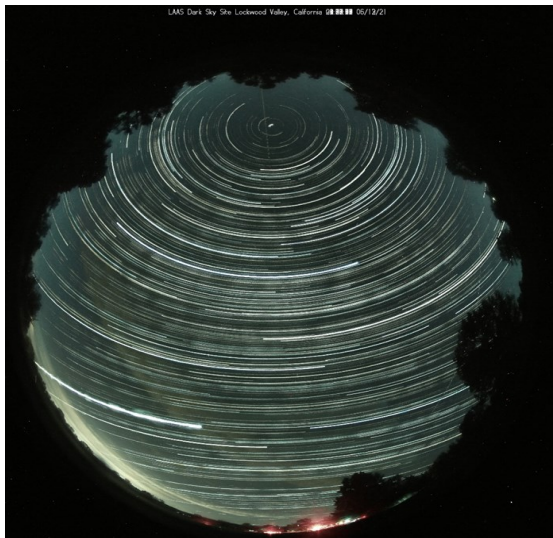
- Because it would be a fun project

- My wife gave me a Raspberry Pi starter kit for Christmas and was asking when I was going to play with it (This reason had more weight than all of the others!).

Before I get into some of the details and design considerations, here are some photos from the all sky camera installed at Lockwood. The software is configured to take consecutive 60 second exposure starting roughly an after sunset until about an hour before sunrise (roughly 700 images). It also creates a time-lapse video and star trail image. During the day, an image is taken every few minutes to show what the sky looks like, but those are not saved These images are uploaded to Google Cloud

and can be accessed via the LAAS website at <https://www.laas.org/lockwoodweather>. The images are refreshed every 5 minutes, day, or night. The website has 2 links, one for the [current image](#) (day or night) and one for a [2-week running archive](#)

Star trail image constructed from images taken roughly 90 minutes after sunset to about 90 minutes before sunrise. Note the Starlink satellite train near Polaris. The red lights at the bottom are from LAAS members and their equipment during a star par-



Clouds, meteor, and moon setting. Arcturus is the bright star near the center.



Milky Way and Jupiter rising (on the lower left). Vega is near the center in this photo.



These two images (60 second exposures) show Starlink satellite trains. For reference, Arcturus is the bright star at the center. The bright light dome on the lower left edge of the images is from Valencia/Santa Clarita Valley.

Construction Details:

I realized that I had 3 options if I wanted to install an all sky camera:

1. Buy a complete system. Systems like the Starlight Oculus cost about \$1000.
2. Build one based on a Windows computer. This approach requires the permanent placement of a Windows PC at Lockwood. The most popular software for this option is the open source AllSkyEye (www.allskyeye.com) that works with a variety of cameras that support the ASCOM standard used for astrophotography. However, even a low-end astrophotography camera (\$150-\$350 without a lens) was still more than what I was willing to spend, and I would have to buy a Windows PC (about \$150-\$200) setup for unattended operation in the trailer at Lockwood.
3. Build one using a Raspberry Pi computer. The Raspberry Pi (about \$55) can be configured to run unattended and is small enough it can be bundled into the same housing as the camera. It runs a version of Linux which requires far fewer resources (CPU, memory, and disk storage) than Windows and is more robust. Open source software developed by Thomas Jacquin (<https://github.com/thomasjacquin/allsky>) can be configured to work with some ZWO cameras, but a newer version allows the use of the recently released Raspberry Pi HQ camera (\$50). This is a fairly sensitive, decent resolution (12 Megapixel, Sony IMX219 sensor) camera that can be paired with a 180-degree fisheye (\$50-\$70).

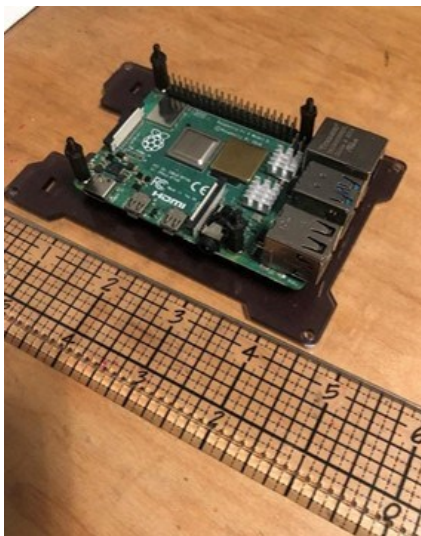
Of course, if you want to install the system outdoors, you will have to spend about \$30-50 for a housing, power supply, cables, etc. But overall, the cost is pretty reasonable as long as you're willing to spend a little bit of time following some of the YouTube videos and blog postings on how to build your own system.

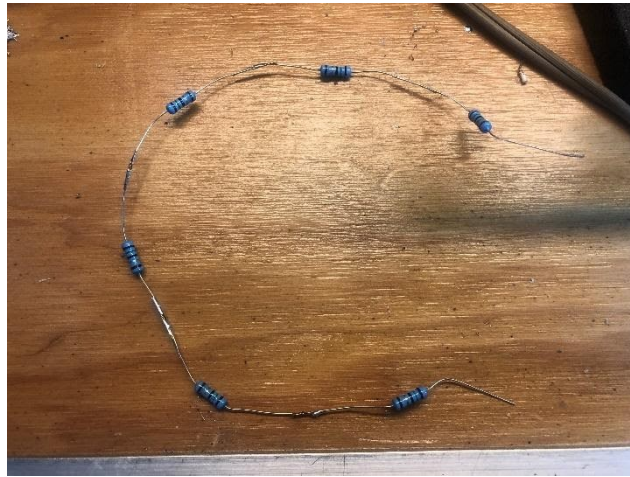
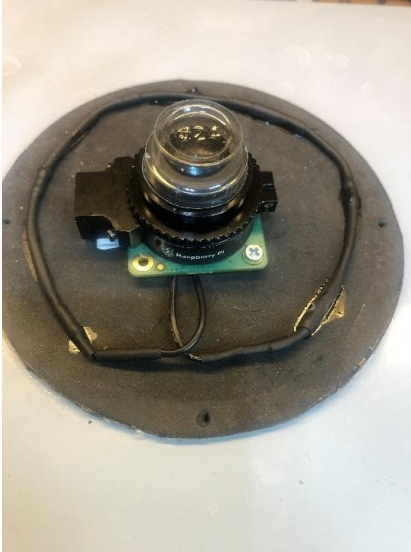
Since I wanted to make this a semi-permanent installation at Lockwood, I knew I had to do something to prevent fogging of the acrylic dome over the camera during the cooler months. Since I had an Arduino microcontroller that I got for Christmas a couple of years ago but had not used for anything, this was the perfect chance to play with it as well. I got a temperature/humidity sensor (about \$7) and spent \$5 for a relay to control a dew heater made from resistors that I had lying around. The Arduino can measure the temperature/humidity, calculate the dew point, and turn on a relay to energize the heater when the dew point drops to within a few degrees of the ambient temperature. There are tons of tutorials on how to measure the temperature and humidity and also on how to trigger a relay, so it was relatively simple to merge commands from two tutorials to construct a dew zapper. A more elegant solution is to use the Pi to also monitor the humidity and control the dew heater, and for version 2 of this project (currently under construction), that's exactly what I've done.

I was also concerned about the enclosure getting too hot, so I put in louvered vents, added a small 12 v fan stripped from an old computer, and wrapped the entire enclosure in reflective bubble wrap insulation. The prototype that's currently installed at Lockwood has temperature sensors to monitor the ambient, internal, and CPU temperatures to see how well the reflective insulation and fan are working as we go into the summer months.

The Raspberry Pi has a built in Wi-Fi, but during the initial setup, I had to plug in a USB keyboard, mouse, and small monitor to configure it. Once that was done, they can be removed, and the Pi managed and programmed via either a Wi-Fi or wired network connection using remote control software that comes with the operating system. This is an important feature since I wanted to install the all sky camera at Lockwood, about 90 miles from my house. I've been able to reprogram the all sky software, change the Arduino settings for turning on the dew heater, and upload programs to monitor and reboot the Pi if things go wrong.

Many thanks to fellow LAAS member Al Alecia who helped install the all sky camera on the roof of the trailer at Lockwood and for helping me troubleshoot and tune it over the course of several weeks.





Raspberry Pi all sky camera construction. From left to right clockwise: (1) Raspberry Pi computer with 4 GB memory, 256 GB SD card for disk drive, and quad core 1.5 Ghz processor. (2) Raspberry Pi with HQ camera connected via ribbon cable. Initial setup is performed with a USB keyboard/mouse (red cable) and small LCD monitor. After initial configuration, everything can be done remotely via the built in Wi-Fi connection. (3) Resistor string to form dew heater. (4) Dew heater and HQ camera ready to be mounted under acrylic dome



Raspberry Pi, Arduino, relay for dew heater, and power supply in weatherproof enclosure. Since this is a proof of concept device, the parts are not bolted down. The reflective bubble insulation reduces heat build-up from the sun, and the fan helps keep the Pi and Arduino from overheating. The ambient humidity and temperature are measured by the small white sensor seen on the side of the enclosure and shaded by a piece of bubble insulation to keep the sun from shining directly on it.

The End of Night

By Spencer L. SooHoo

This is part of title of a book, *The End of Night: Searching for Natural Darkness in an Age of Artificial Light* by Paul Bogard. Figure 1 vividly illustrates the end of night over the Los Angeles Basin.

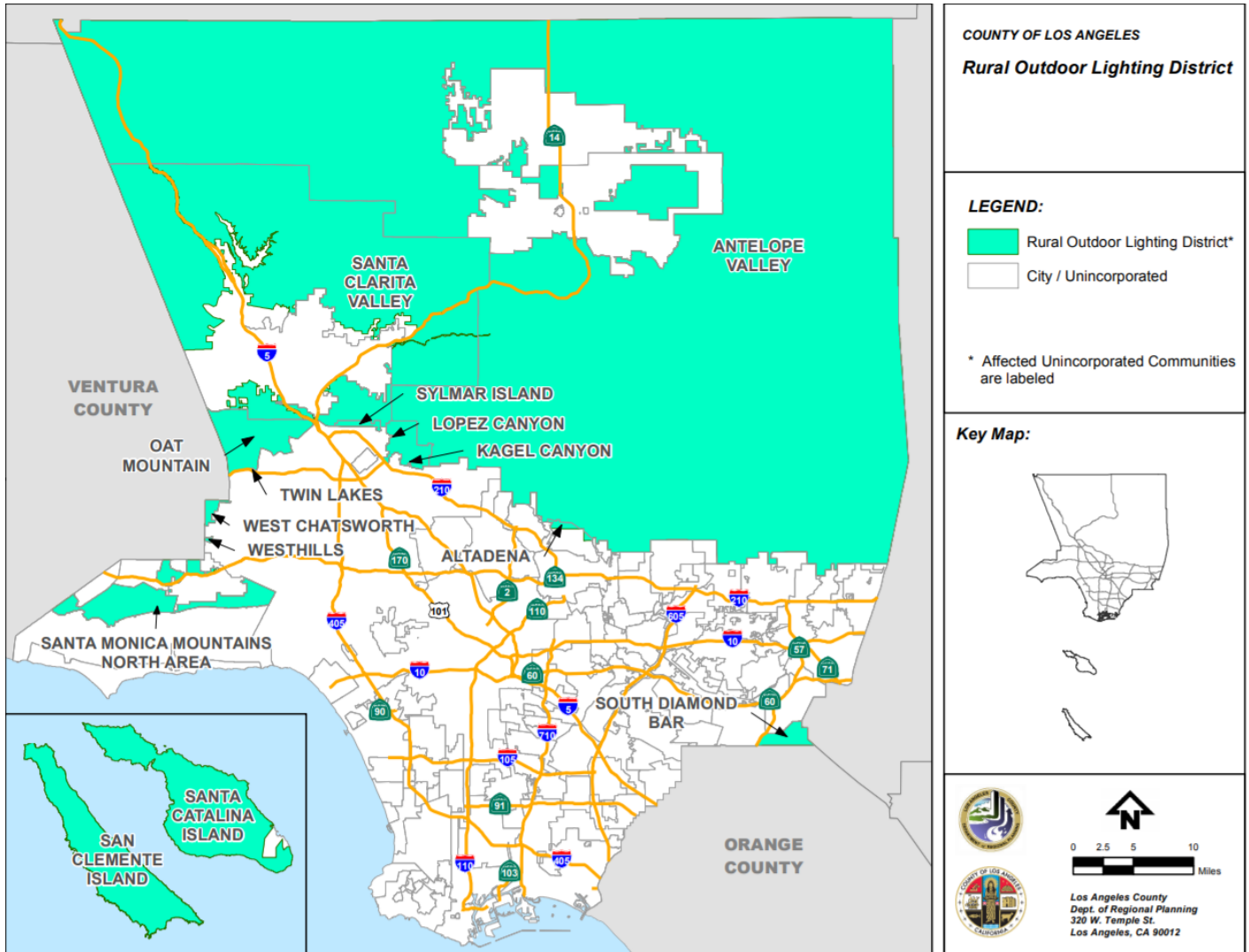


Figure 1. Los Angeles as seen from Mt Wilson over the decades.
 Source: Martínez-Ledesma, Miguel & Sanhueza, Pedro & Corco, Carlos & Astudillo, Hugo & Angeloni, Rodolfo & Damke, Guillermo & Falchi, Fabio & Blanc, Guillermo. (2019). Spectral and Zonal Restriction Justification - Review Process of DS043/2012 MMA (Ministry of Environment). 10.13140/RG.2.2.11949.31206.

As LAAS members, we all have an appreciation of the wonders of the night sky and many of us drive miles to get to our dark sky site in the Lockwood Valley. Unfortunately, over the years, the encroachment of light pollution from Valencia and the Santa Clarita Valley has worsened. Several years ago, we painted the edges of the viewing pads and power outlets with white paint so they would be easier to see in the dark. Today, there is enough sky glow from light pollution that seeing the edges of the pads is not a problem.

When I heard that the Centennial Development had been approved by the LA County Board of Supervisors (https://planning.lacounty.gov/view/centennial_specific_plan) I was concerned that the presence of about 20,000 houses and 57,000 residents northeast of the intersection of State Route 138 and Interstate 5 would severely degrade the night skies near our dark sky site. A lawsuit was filed (<https://www.courthousenews.com/environmentalists-sue-to-invalidate-la-county-housing-project/>) and a judge found that two items in the Environmental Impact Report (EIR), mitigation of greenhouse gases produced by the project and wildfire risk had not been adequately addressed. The Tejon Ranch Company's spin on this (<http://tejonranch.com/category/press-release/>) is that these are minor issues that can be readily addressed by revising the EIR. Something will be built over the next 20 years. It's inevitable. The development may not be as large as envisioned, but it will happen. Related projects are the Grapevine at Tejon Ranch project that is projected to have 12,000 residential units and 5.1 million square feet of commercial space in Kern County (near the Ikea distribution center on Interstate 5 about 15 miles North of Frazier Park), and Mountain Village at Tejon Ranch, a smaller development of 3,450 high-end single-family homes, golf course, shopping center, and 750 hotel rooms. The Grapevine project has already received approval from Kern County to proceed.

The Centennial development proposal was a catalyst for us (John O'Bryan, Rod Kaufman, and me) to see what we can do to reduce light pollution. Rod had already done some homework and found that in 2014, Los Angeles County developed a dark sky ordinance for the un-incorporated areas of LA County (https://planning.lacounty.gov/view/rural_outdoor_lighting_district_ordinance/). The Rural Outdoor Lighting District (ROLD) ordinance was originally proposed in 2011 and finally adopted in 2014. The boundaries are shown in Figure 2. Without getting into the technical and legal details, this is an ordinance that is intended to regulate outdoor lighting to encourage energy conservation and promote dark skies while allowing for nighttime safety and security. The ROLD contains requirements for street lighting in rural areas, outdoor recreational facilities, and signage and incorporates many elements of the International Dark Sky Association's model lighting ordinance (<https://www.darksky.org/our-work/lighting/public-policy/ml0/>)



..IOTHERMAP_SERIES\supp_dist\map_documents\Supp_Dist_Rural_Outdoor_Lighting_District

Figure 2. Los Angeles County Rural Outdoor Lighting District Map

Continued on next page

Our immediate concern was the Centennial Development and although the map in Figure 2 showed that it was within the ROLD boundaries, we were concerned that there would be loopholes that that would negate the intent of the ordinance. We had a Zoom meeting with the author of the ROLD, and he assured us that it would apply to the Centennial project. However, there are some loopholes. While the ROLD applies to the Centennial project, any projects within the ROLD boundaries that were approved prior to the adoption of the ordinance would be exempt. Also, while a developer may install compliant street lighting, etc. there is virtually no proactive enforcement for homeowners who do not comply. Enforcement depends primarily on neighbors registering a complaint with LA County Building and Safety.

While curbing light pollution (or at least keeping it in check) in the LA Basin and surrounding area may seem like a daunting task, we can take some baby steps and learn what works and what doesn't work before taking more ambitious steps. The International Dark Sky Association (<https://www.darksky.org/>) is a resource we can tap, and we can contact other cities that have adopted dark-sky friendly ordinances and learn from their experiences. They published an encouraging interview with one of their members who has had some successes in Houston, Texas (<https://www.darksky.org/advocate-qa-with-debbie-moran/>).

The author of LA County's ROLD suggested that we start with some communities that border the national forests, since he has had requests from some residents there who are interested in preserving dark skies. This will have to be an ongoing effort on many levels, including education and awareness efforts, working with elected officials to effect legislative changes, and working with regulatory agencies to ensure compliance with building codes that help minimize light pollution. A point that was made in our meeting with the ROLD author is that the time to make the case for dark-sky friendly lighting is when a public meeting is held for the permitting and EIR process. That's when any special interest group has the most leverage; all comments made by the public must be recorded and addressed before a project is approved. This means monitoring press releases and notices for public hearings. Speaking for myself, I heard about the Centennial project only after the LA County Supervisors approved it.

If anyone is interested in participating in this effort, please contact me at: secretary@laas.org. The three of us can't do too much by ourselves. It will take a lot of work, patience, and persistence, but we can make an impact.



Monthly Sky Report

By Dave Nakamoto

This is what's happening in the sky in July. I'll discuss the planets in the order they appear in the sky, starting in the early evening.

Venus is still in the evening sky. It sets around 9:30 p.m. in July, while the sun sets around 8:00 p.m. Venus currently displays a gibbous phase and appears small in a telescope. Never observe Venus when the sun is in the sky, for the danger to the eyes is great.

Venus passes in front of the open star cluster M44, nicknamed "The Beehive", on July 2nd. Venus is visible with the unaided eye, but the cluster will need binoculars to see. It's a race, as the darker the sky is the better you'll see the cluster, but the cluster will be lower to the horizon and harder to see.

Mars continues its west to east motion through the constellations of the Zodiac. Mars is low in the west and sets around 9:30 p.m. Mars is too small to see anything in amateur telescopes, and so the time to observe Mars is practically over until the second half of 2022.

Saturn rises in the east about 9:00 p.m. in the southeast. A small scope should show the rings with enough magnification, and perhaps the largest and brightest of Saturn's moons, Titan, which will show up as a faint star close to Saturn.

Jupiter rises about 10:00 p.m. in the east. A small telescope will show the two cloud belts of Jupiter, and its four brightest moons will show up as stars close to Jupiter and in a rough line. As they move around Jupiter, they pass in front of and behind Jupiter's disk. When they pass in front, the moons and their shadows can be seen on the Jovian disk.

Mercury starts off the month in the morning sky. It rises in the east around 4:30 a.m. while the sun rises at 5:45 a.m. It passes close to the sun by the 22nd and will not appear in the evening skies until the middle of August. Never observe Mercury when the sun is in the sky, for the danger to the eyes is great.

Due to the fact that the lunar phase is about 29.53 days, occasionally there are two identical lunar phases in a month. The Moon's phases are:

Last Quarter – 1st

New Moon – 9th

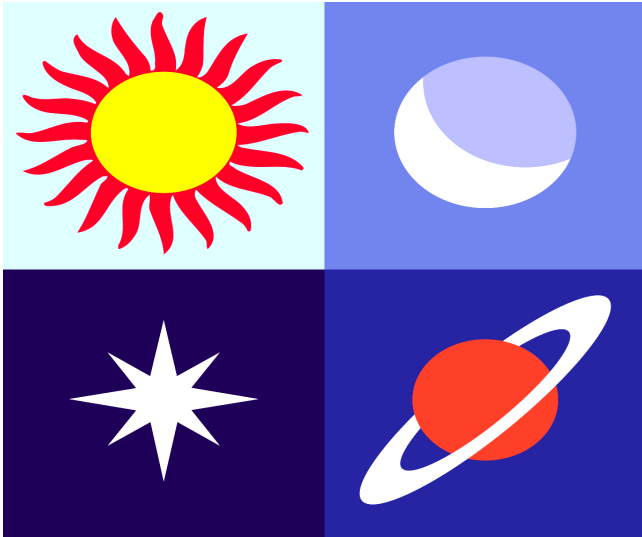
First Quarter – 17th

Full Moon – 23rd

Last Quarter – 31st

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

July 4 - Mercury at Greatest Western Elongation. The planet Mercury reaches greatest western elongation of 21.6 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 morning sky. Look for the planet low in the eastern sky just before sunrise.

July 10 - 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 01:17 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.

July 24 - 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 02:37 UTC. This full moon was known by early Native American tribes as the Buck Moon because the male buck deer would begin to grow their new antlers at this time of year. This moon has also been known as the Thunder Moon and the Hay Moon.



July 28, 29 - Delta Aquarids Meteor Shower. The Delta Aquarids is an average shower that can produce up to 20 meteors per hour at its peak. It is produced by debris left behind by comets Marsden and Kracht. The shower runs annually from July 12 to August 23. It peaks this year on the night of July 28 and morning of July 29. The nearly full moon will be a problem this year. Its glare will block most of the faintest meteors. But if you are patient, you should still be able to catch a few good ones. Best viewing will be from a dark location after midnight. Meteors will radiate from the constellation Aquarius, but can appear anywhere in the sky.

Mark Your Calendar!

August 12, 13 - Perseids Meteor Shower. *The Perseids is one of the best meteor showers to observe, producing up to 60 meteors per hour at its peak. It is produced by comet Swift-Tuttle, which was discovered in 1862. The Perseids are famous for producing a large number of bright meteors.*

Source:

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

Additional Links:

Moon Phases Chart for 2021

<https://www.mooninfo.org/moon-phases/2021.html>

Sky Report—Griffith Observatory

<http://www.griffithobservatory.org/sky/skyreport.html>

NASA News:

<https://www.nasa.gov/topics/solarsystem/index.html>

JPL News:

<https://www.jpl.nasa.gov/news/>

July 2021

| Sun | Mon | Tue | Wed | Thu | Fri | Sat |
|-----------------|-----------------------|-----|--------------------|-----|-----|----------------------|
| | | | | 1 | 2 | 3 |
| 4 Happy 4th! | 5 | 6 | 7 Board Meeting | 8 | 9 | 10 Dark Sky Night |
| 11 | 12 General Meeting | 13 | 14 | 15 | 16 | 17 |
| 18 | 19 | 20 | 21 | 22 | 23 | 24 |
| 25 | 26 | 27 | 28 | 29 | 30 | 31 |

Meet The New Members

Welcome to the LAAS!



Greg Wu

Stefan Born

Alan Christopherson

Shmuly Goldsmith and Luca Cupula

Bruce and Fanny Watanu

Stefan and Jonah Grunspan

Robert Ferber and Family

Ami Goff and Family

Gustova Gil

Cameron Saleless and Allard

Mike Porras and Family

Aleka and Viktoriya Gorohovsky

Tim and Hazel Durham

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 still needed 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.](#)



Join the Astronomical Society of the Pacific and help support the cause of advancing science literacy through engagement in astronomy. Member benefits include a **subscription to the online Mercury Magazine**, published quarterly, and **Astronomy Beat**, a monthly on-line column written by "insiders" from the worlds of astronomy research and outreach.

Subscribe or renew to the McDonald Observatory's StarDate Magazine and receive a special discount. Go to this page and press "Add to Cart" under the kind of subscription you want:

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



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Mt. Wilson Coordinator: Darrell Dooley

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Griffith Observatory:

213-473-0800

Sky Report:

213-473-0880



Follow us on social media by clicking
on one of the images below



Instagram



Find astronomy outreach activities by
visiting NASA's Night Sky Network:

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

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