



# THE LOS ANGELES ASTRONOMICAL SOCIETY

# THE BULLETIN

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© Brian Paczkowski

The galaxies NGC 4725 and the smaller NGC4712 in the constellation Coma Berenices. This is an LRGB color composite made from a total of 5 hours of data taken last at Lockwood Valley under a half moon sky. Stacked in Nebulosity and processed in PixInsight (Celestron 1100 EdgeHD, 0.7x focal reducer, 10Micron GM2000 HPS II mount, ZWO ASI 1600mm-cool at -25C)

**Photo Credit: Brian Paczkowski /LAAS**

**SAVE THE DATE - SUNDAY, JUNE 9, 2019**

**LAAS Open House, Swap Meet, and BBQ!**

More info coming soon!

### New Contact Info?

If you have recently moved, changed your email address or phone number, please contact our club secretary by sending an email to [secretary@laas.org](mailto:secretary@laas.org) with your new contact information.

Interested in joining the Los Angeles Astronomical Society?  
To find our membership application and further information,  
please visit our website at [LAAS.org](http://LAAS.org).

# Lockwood Committee Report

## By John O'Bryan, Jr.

Saturday, April 20, 2019

We had a great team at Lockwood yesterday to dig the foundation for the new restroom.

Many thanks to Spencer Soohoo, Ernesto Velasques, Brian Paczkowski, Nasir Jeevanjee, Mike Tyszka, Michael Ogle, and Richard Plantenga! The digging is done and next Friday and Saturday we will fill the holes back in with concrete. We relaxed with pizza and beer at Mike's in Frazier Park and were on the road by 3:00 PM.

Work resumes at 10:00 AM next Friday, April 26th and Saturday, the 27th, if needed. It will be 3rd quarter moon so plan on staying the night and do some observing before the moon comes up.

The following pictures were shot by Spencer Soohoo.

John O'Bryan, Jr.

Lockwood Committee





# Exploring Lunar Craters

## By Ray Blumhorst

Whether exploring the solar system, or just working on astro-imaging skills, the Moon is a great place to start. From Earth, it's the closest natural solar system satellite at about 240,000 miles distance so it's relatively close in terms of space exploration. Being that close to Earth also makes the Moon a relatively easy target for astro-imagers, and just casual backyard observers.

The most visually dominant lunar features are arguably the huge dark areas called Mares (Latin for seas) were formed from ancient lava flows. But some would argue that the vast number of impact craters created by asteroids, meteors and comets are just as visually impressive.



April 14, 2019 - (74% illuminated, waxing gibbous moon)

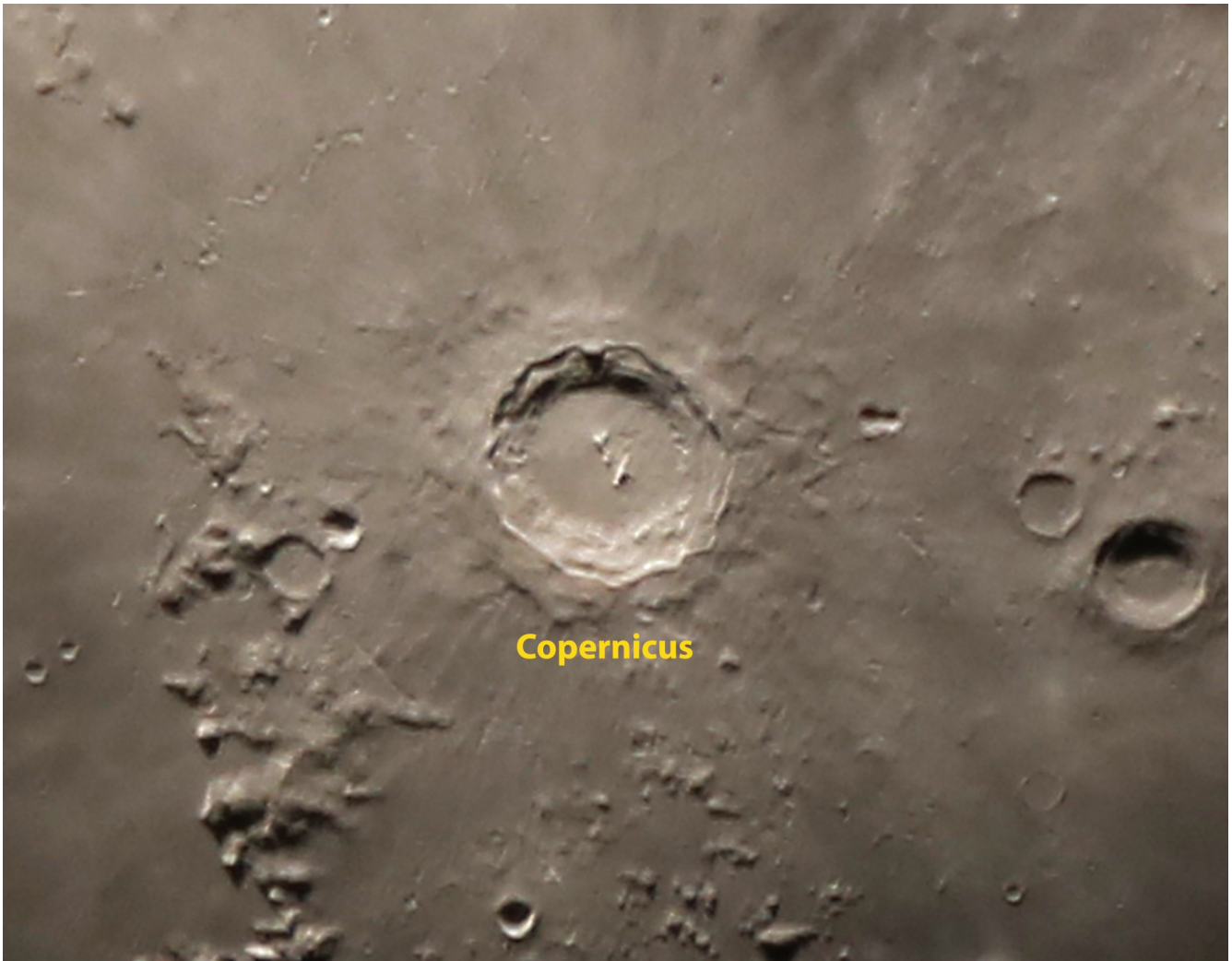
The lunar terminator is the line between the day-lit and dark-night sides of the lunar surface. On April 14<sup>th</sup>, several lunar features along the terminator were standouts, but two of the most notable were the craters Clavius and Copernicus.



April 14, 2019 – Clavius crater

Inside the main impact crater that formed Clavius, a number of smaller craters exist. Clavius' main crater is 143.5 miles in diameter and 2.17 miles deep. Clavius has been hit harder than a punch-drunk boxer. I counted thirteen impact craters, then went back and tried to count the even smaller impacts, yielding a total of around twenty in number. A clearer night and bigger telescope may well have revealed even more.

All of the astro-images captured on this night were taken with a Canon 70D attached to a Celestron, 8-inch, Edge HD telescope. The camera was tethered through a USB cable to a MAC laptop that ran the Canon Utilities that captured these images.



April 14, 2019 - Copernicus crater

Copernicus crater is another large lunar crater, that's 57.8 miles in diameter and 2.36 miles deep. It has a central peak that rises 3,937 feet above the crater's floor. However, no smaller impact craters could be found inside Copernicus' main crater. Why? Let's examine the lunar timeline:

# The Moon is estimated to have formed 4.51 billion years ago.

# The "late heavy bombardment" (LHB) is estimated to have occurred from 4.1 to 3.8 billion years ago. It was a time in solar system history when a disproportionately large number of asteroids are theorized to have collided with planets and moons in the inner solar system.

# Clavius is estimated to be 4 billion years old.

# Copernicus is estimated to be only .8 billion years old (a mere youth in astronomical terms).

The relatively old age of Clavius would appear to explain why there have been so many impact craters inside its main crater. It's just been around longer to get hit by incoming asteroids, meteors, and comets, and there were a lot more impacts and collisions in the early solar system when the LHB was occurring.

Okay, but how have we determined the age of those craters?

Counting craters that exist within other craters, and analyzing lava flows and impact-melt moon rocks brought back to Earth by Apollo missions are the primary methods that have established most of the Lunar crater timeline. Scientific analysis of the latter two and other moon surface samples have also yielded the current estimates for the Moon's age and the time of the LHB. Some rocks from the Moon have also been found in our Earth's deserts and used in this scientific analysis.

Compared to other objects in the night sky, the Moon is a ubiquitous astro-imaging target throughout the year, except on nights when there are clouds, or a new moon. It may not be as impressive to some as the planets, or deep sky objects, but it's almost always present and getting to it is a lot easier.

# Watching the Late Spring Skies

By David Prosper

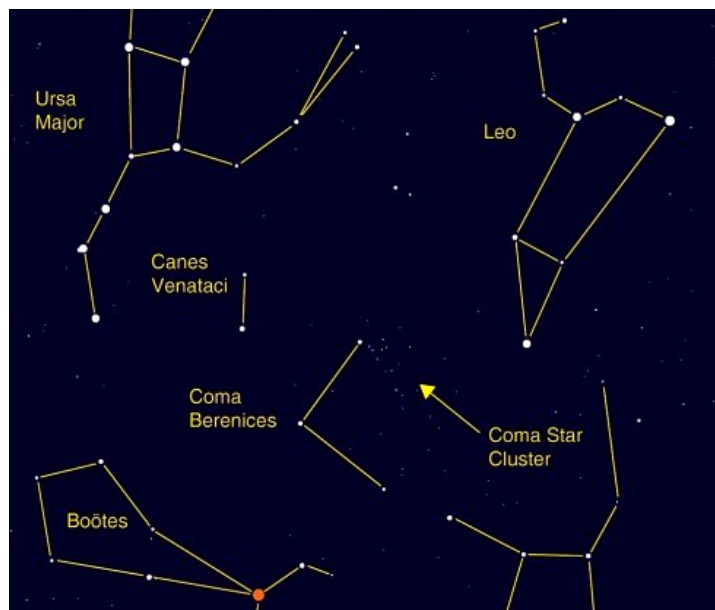
Late spring brings warmer nights, making it more comfortable to observe a good showing of the Eta Aquarids meteor shower. Skywatchers can also look for the delicate Coma Star Cluster, and spot the Moon on the anniversary of Apollo 10's "test run" prior to the Moon landing in 1969.

The Eta Aquarids meteor shower should make a good showing this year, peaking the morning of May 6. This meteor shower has an unusual "soft peak," meaning that many meteors can be spotted several days before and after the 6th; many may find it convenient to schedule meteor watching for the weekend, a night or two before the peak. You may be able to spot a couple dozen meteors an hour from areas with clear dark skies. Meteors can appear in any part of the sky and you don't need any special equipment to view them; just find an area away from lights, lie down on a comfy lawn chair or blanket, relax, and patiently look up. These brief bright streaks are caused by Earth moving through the stream of fine dust particles left by the passage of Comet Halley. While we have to wait another 43 years for the famous comet grace our skies once more, we are treated to this beautiful cosmic postcard every year.

While you're up meteor watching, try to find a delightful naked eye star cluster: the Coma Star Cluster (aka Melotte 111) in the small constellation of Coma Berenices. It can be spotted after sunset in the east and for almost the entire night during the month of May. Look for it inside the area of the sky roughly framed between the constellations of Leo, Boötes, and Ursa Major. The cluster's sparkly members are also known as "Berenice's Hair" in honor of Egyptian Queen Berenices II's sacrifice of her lovely tresses. Binoculars will bring out even more stars in this large young cluster.

May marks the 50th anniversary of the Lunar Module's test run by the Apollo 10 mission! On May 22, 1969, NASA astronauts Thomas Safford and Eugene Cernan piloted the Lunar Module - nicknamed "Snoopy" - on a test descent towards the lunar surface. Undocking from "Charlie Brown" - the Command Module, piloted by John Young - they descended to 47,400 feet above the surface of the Moon before returning safely to the orbiting Command Module. Their success paved the way for the first humans to land on the Moon later that year with Apollo 11. Look for the Moon on the morning of May 22, before or after dawn, and contemplate what it must have felt like to hover mere miles above the lunar surface. You'll also see the bright giant planets Saturn and Jupiter on either side of the Moon before sunrise.

When will humans travel to those distant worlds? You can catch up on all of NASA's current and future missions at [nasa.gov](https://www.nasa.gov)



Try to spot the Coma Star Cluster! Image created with assistance from [Stellarium](https://www.stellarium.org)



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 [night-sky.jpl.nasa.org](https://night-sky.jpl.nasa.org) to find local clubs, events, and more!



# Why did Humans Develop the Ability To See the “Visible Portion” Of the Electro-Magnetic Spectrum?

By Fred Zimmerman

In the evolution of humans, it was vital that a person be able to identify objects such as other humans, animals, plants, trees, rocks, and water, in order to recognize and deal with friends, enemies, food, and safe havens. If we humans could not identify dangerous or beneficial parts of our environment we could not have survived as a species. We would not be able to form alliances with other humans to fight off predators and to provide vital support for the group’s needs; we would not be able to avoid dangerous animals and to hunt and domesticate the useful ones; we would not be able to avoid the poisonous fruit or plants and to find and later cultivate the beneficial ones. We would not be able to recognize dangerous environments or terrain and find the protective locations.

So, the questions are: (1) What phenomena in our universe provide the information that would be vital to human life? (2) What parts of the human body are available to take in that available information?

We discuss answers to these questions later in this document but first, to better understand those answers, let us discuss the concept of “waves.” We are familiar with the waves in water. If a rock is dropped in a pool of water, waves in the water move outward in all directions. The water itself is not moving away but is just moving up and down, and this up-down movement spreads out from where the rock fell. The distance from one top of the wave to the next top of the wave is called the wavelength. If the tops are counted as they pass by a fixed point, the number of tops that come by in a second is called the frequency. The wavelength and the frequency are inversely related. If the wavelength is long, the frequency is small (sometimes called “low”). If the wavelength is short, the frequency is large (sometimes called “high”). Another way of thinking about this relationship is as follows: If the wavelength is long, it takes more time for the next wave to come by, so the number of waves in each second is low; so a long wavelength means a low frequency; if the wavelength is short, more waves come by in a second, so the frequency is high.

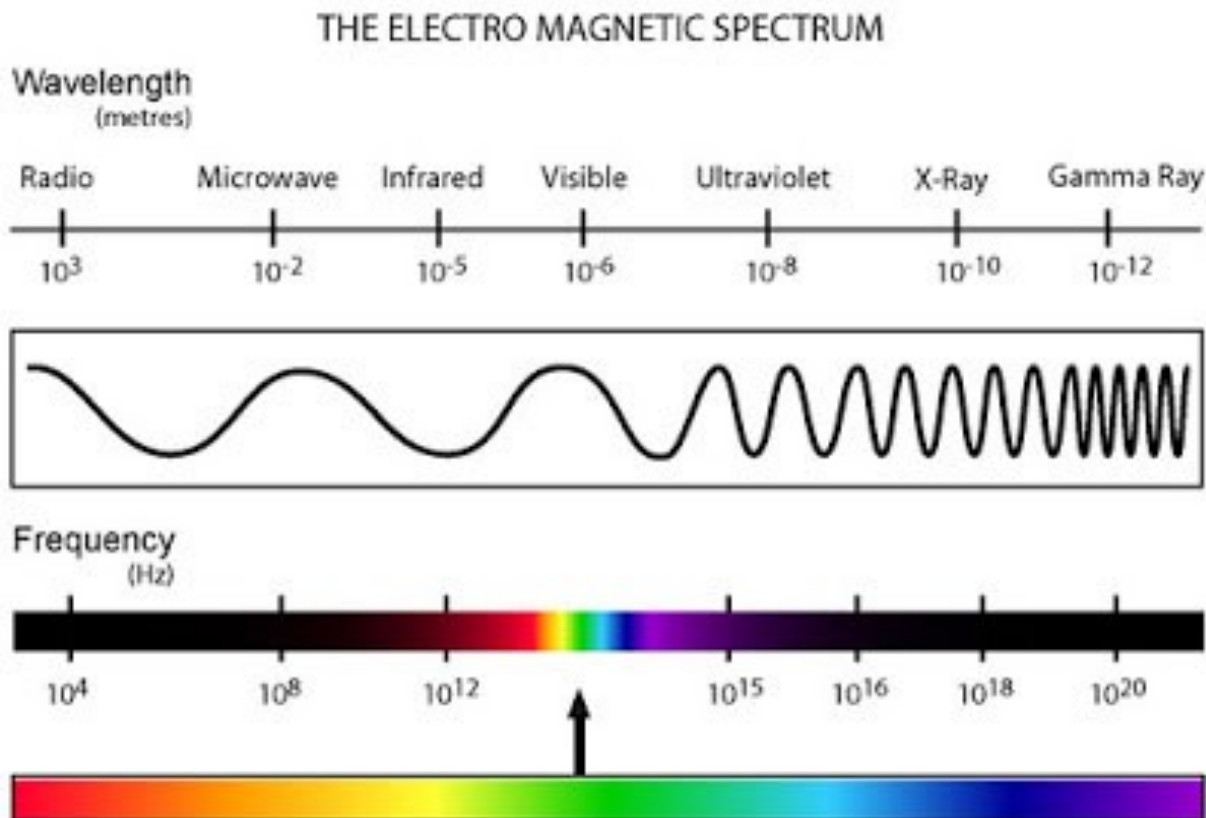


Image Souce: NASA

Now, consider our encounters with electricity (example; light bulbs) and magnetism (toy magnets, compasses). It turns out that electricity and magnetism are tied together; they are both parts of the same physical phenomenon in our universe. We call this combination “electromagnetism.” And, this electromagnetic phenomenon travels in space as a wave; but, unlike water, the electromagnetic energy and influence actually do move from one location to another. Here are some examples of electromagnetic waves: Light from the Sun and stars. Reflected light from the Moon and planets and our faces and lions. TV signals and cell phone messages that we produce and send out to watchers and listeners. Heat called “Infrared waves”) from the Sun or from fires or from hot stoves. Xrays that we use in the doctor’s office to see broken bones. Ultraviolet waves from the Sun that cause our skin to develop a tan.

We can portray these electromagnetic waves in a graph, which is called the Electromagnetic Spectrum. Typically, the left end of the graph is Zero frequency, and the frequency increases toward the right end of the graph. And, the longest wavelength is on the left (infinite at zero frequency) and the wavelength decreases toward the right in the graph. The Spectrum typically contains labels for portions of the graph. For example, some of the lower frequencies (on the left) are called “radio waves.” Further to the right are “infrared” labels, then “visible,” then ultraviolet, then xrays, then gamma rays.

Now let us return to the two questions raised earlier: Question 1) What phenomena in our universe provide the information that would be vital to human life?

The answer to question 1 is: The electromagnetic waves are the only mechanism in our universe that carries information over distances. Other phenomena such as vibrations (sound waves), chemical markers (aromas and tastes) and physical contact (touch) are limited both in their information content and the duration and spatial reach. For example, these other phenomena do NOT provide useful information about shapes, sizes, colors, edges, and detailed features.

Even more striking, it turns out that in the entire Electromagnetic Spectrum there is one tiny portion which carries all of the information used by us to survive in our environment, and that tiny portion is called “Visible”. In the entire electromagnetic spectrum the tiny portion we call the “visible” is the only

portion that reflects sharp edges, outlines and details of objects that the light hits.

At the lower end of the visible spectrum, infra-red, some limited information is provided, but this extra information is only about hues and adds very little about the shapes and sizes and features of objects; further into the infra-red spectrum the objects appear as fuzzy shapes; these images do not add information which is useful to human activities. Similarly, at the upper end of the visible spectrum are the ultra-violet frequencies; again, these frequencies add little if any environmental information which is useful to humans. Furthermore, at frequencies lower than infra-red and above ultra-violet the spectrum does not provide any practical information about the nature of our environment. Of course, x-rays do provide information about objects that are otherwise hidden from view; but there is no evidence that such information is vital to the normal functions of human society in the earlier stages of evolution.

Question 2) What parts of the human body are available to take in that available information?

The answer to question 2 is: The only human sensors that can provide the information carried by the Electromagnetic Spectrum are our eyes, and our eyes can only see the tiny portion of the spectrum that provides the information we need.

Now, we know that other animals on Earth also developed eyes that see the Visible portion of the spectrum, but those animals did not then evolve brains to use that information as we do.

Thus, there are three features of our world that continue to amaze me: 1) that only a very tiny portion of the electromagnetic spectrum provides the wealth of detail about our environment, 2) that we humans developed eyes that could see this tiny portion, and 3) we then developed the brains to use this vast amount of information and thereby survive as the dominant species (so far!).

Learn more about the Electromagnetic Spectrum by following this link:

Video/NASA: [https://science.nasa.gov/ems/01\\_intro](https://science.nasa.gov/ems/01_intro)

# Rupes Recta

## Nasir Jeevanjee



Sun and the Moon were the highlights at yesterday's Griffith star party. A lone donut shape sunspot was interesting to see. Later interesting feature on the Moon called Rupes Recta was clearly visible. It's a 120 Km Long cliff or a wall and about 300m high with width ranging from 2-3 km. Of course other features around terminator were crowd pleasers as well!

Photo Credit: Nasir Jeevanjee

April 13, 2019

# From The LAAS Archives

## Lew Chilton, Club Historian



LAAS members, from left, Tom Johnson, Dave Balogh and Lew Chilton, at Johnson's home in Inglewood, Calif., c. 1962. Johnson is showing his nearly completed 18-3/4-inch Cassegrainian telescope. The optics had not yet been coated, so Venus was the only object observed. This telescope appeared on the cover of the March 1963 issue of *Sky & Telescope*. Johnson was LAAS president in 1964 and was the founder of Valor Electronics and Celestron-Pacific.

(From an Ektachrome by L. Chilton)

LAAS ARCHIVE



**The Forty-Inch Model of the Moon**

-53-

**William Andrews Clark, Jr. Observatory, Los Angeles, Calif.  
Source: Bulletin of the Southern California Academy of Sciences  
July, 1919, Volume XVIII, Part 2**

**Illustration from the article, "The Clark Observatory," pp. 46-53**

**LAAS ARCHIVE**

Where did Los Angeles amateur astronomers hang out before there was a Griffith Observatory? Why the Clark Observatory on West Adams Blvd., near USC, of course! Here's an interior view in 1919. The observatory existed from 1917 to 1934. The building was razed in 1951.

Lew Chilton/LAAS Historian

# Mt. Wilson Nights

## 2019 Session Schedule

### Session Schedule:

#### 60 Inch Nights

Saturday, May 4

Sunday, June 30

Friday, August 23

Friday, Sept. 27

Saturday, Oct. 26

Saturday, Nov. 23

#### 100 Inch Night

Saturday, June 1

The prices for these nights are as follows:

\$50 - 60 Inch Nights

\$170 - 100 Inch Night

All of the dates above have been posted on the club calendar. These are private events exclusive to current LAAS members, families, and their guests only.

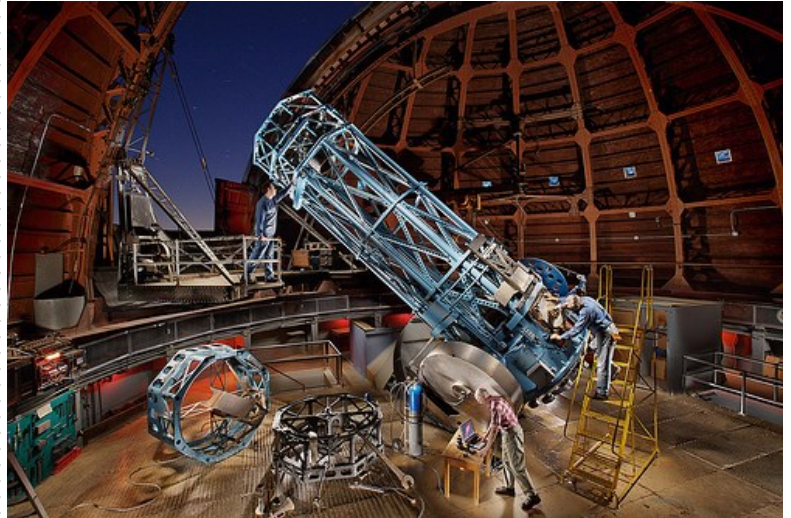
Please click on the following link to contact Darrell Dooley, our Mt. Wilson Coordinator before submitting payment.

[mtwilsoncoordinator@laas.org](mailto:mtwilsoncoordinator@laas.org).

To pay using PayPal or by credit card, please use the following link:

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

To pay by check, please mail your check to:  
LAAS c/o Griffith Observatory



\*Please write "60 Inch" on your check. Make your check payable to: LAAS

Note: If you pay by check, your check may be held by our Treasurer for several weeks, before clearing your bank.

## Meet The New Members



David Frey and Family

Lauren Korduner

Ernesto Velezquez

Brandon Nelson and Margo Diamond

James and Mary Rodriguez

William Schoemaker

Diana Velez

Jay Freeman

Kindred Baker

Thomas Trimbach

## LAAS Board Meetings

Our LAAS Board Meetings take place once a month at the Garvey Ranch Park Observatory. You can find the dates for these meetings on our event calendar. All members are welcome to attend all Board meetings. These meetings begin at 8 PM.

All current members may listen to recorded meetings by logging on to our website at LAAS.org and clicking on the "Members Only" tab to find the files. Contact: [webmaster@laas.org](mailto:webmaster@laas.org) for your login credentials.

## 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.

Participating at one of our outreach events is another fine and fulfilling opportunity. This is YOUR club. Don't sit back and let other members do the work and have all the fun! Speak with a club officer and find out how you can volunteer and get more involved in the LAAS as a member.

## Time To Renew Your Membership?

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

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

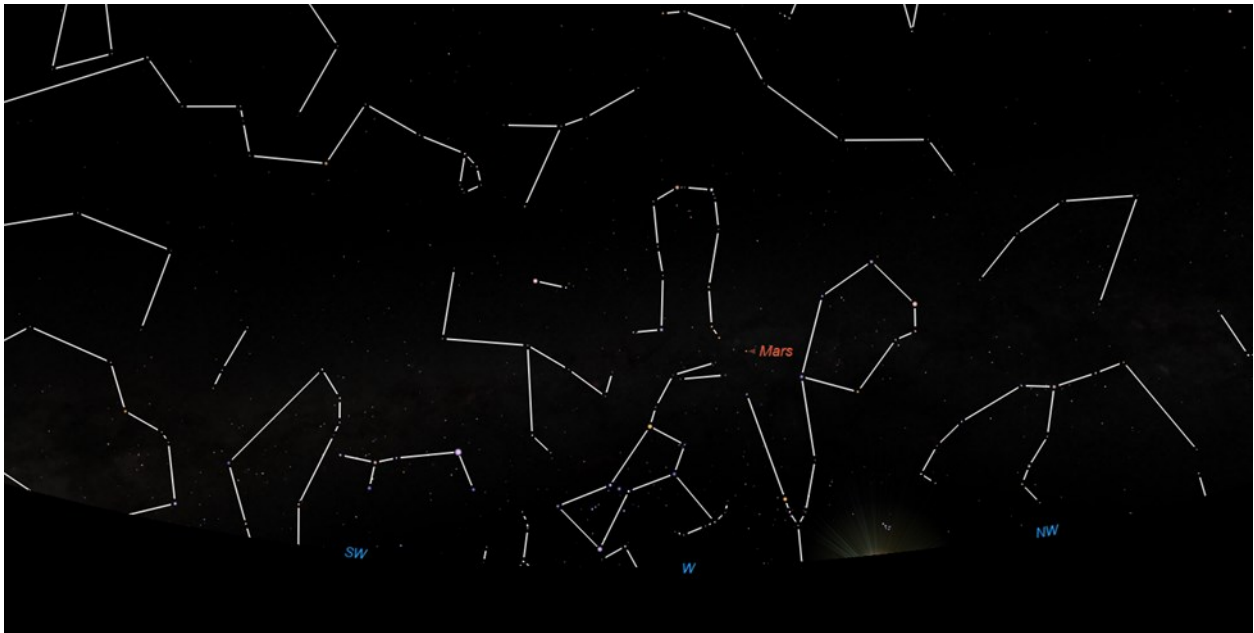
Please send any new contact information to the club secretary at [secretary@LAAS.org](mailto:secretary@LAAS.org).



# May Star Report

## By Dave Nakamoto

Hi! I'm David Nakamoto. Welcome to the night time sky for May. I'll be taking over writing this series of articles from Tré Gibbs. I'm an aerospace engineer specializing in software development and systems integration. I've been an amateur astronomer to over 50 years, and an amateur scientist for as long. I have two telescopes to do night observing, and I mainly do astrophotography. I've been a member of the Los Angeles Astronomical Society (LAAS) since 1989, participating in its activities since the mid 1980s. The LAAS operates the Garvey Ranch Park observatory, located just off the west parking lot, opening it for public viewing every Wednesday night around 7pm to 10pm, weather permitting. There is an 8-inch refractor for visual observations, and a 4-inch refractor for imaging objects up in the sky.



Around 8pm, Mars is low in the west, and is pretty much gone for the rest of this year. It won't be large enough to observe, even in a telescope, until the year 2020. It's 400x smaller than the moon, about the size of a small crater on the moon as seen through a telescope.

Unfortunately, at least for the evening time sky, this is it for planets for a while. All the other planets grace the morning skies this month. Around 3am, Jupiter is directly south, the brightest star there. Saturn is a lot fainter and halfway between Jupiter and the eastern horizon. Venus rises in the east around 5am all month long, making it nearly impossible to observe. Mercury spends the month being too close to the sun. Neptune and Uranus are also in the morning sky.





The lunar cycle is:

New Moon : 4<sup>th</sup>

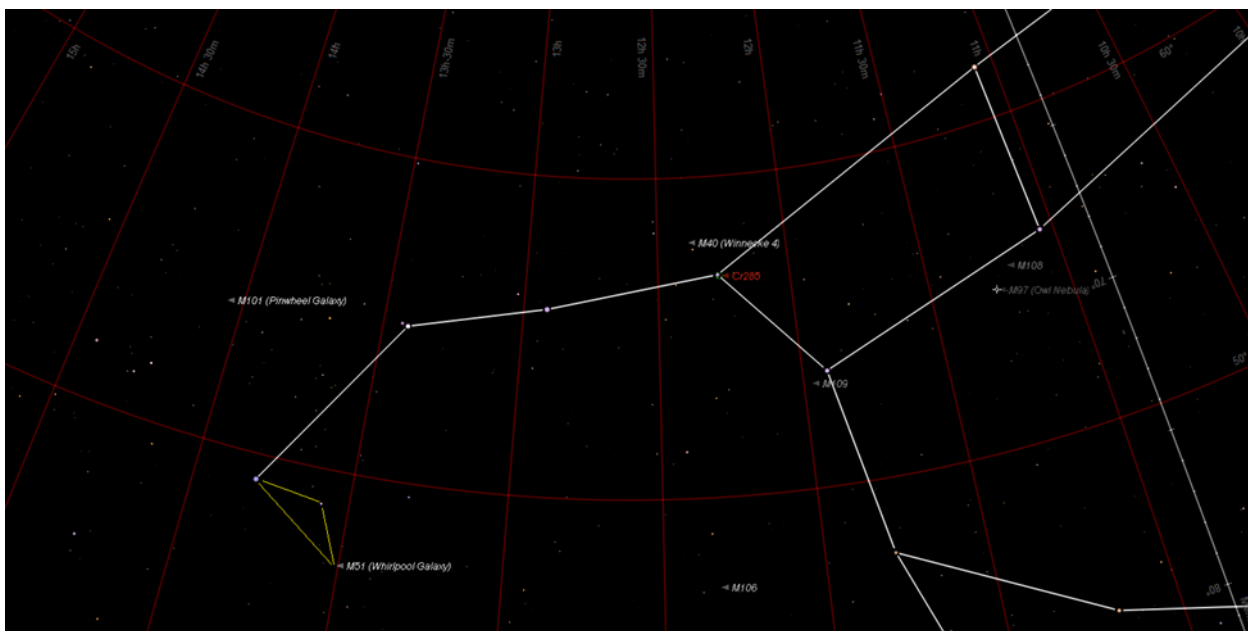
First quarter : 12<sup>th</sup>

Full Moon : 18<sup>th</sup>

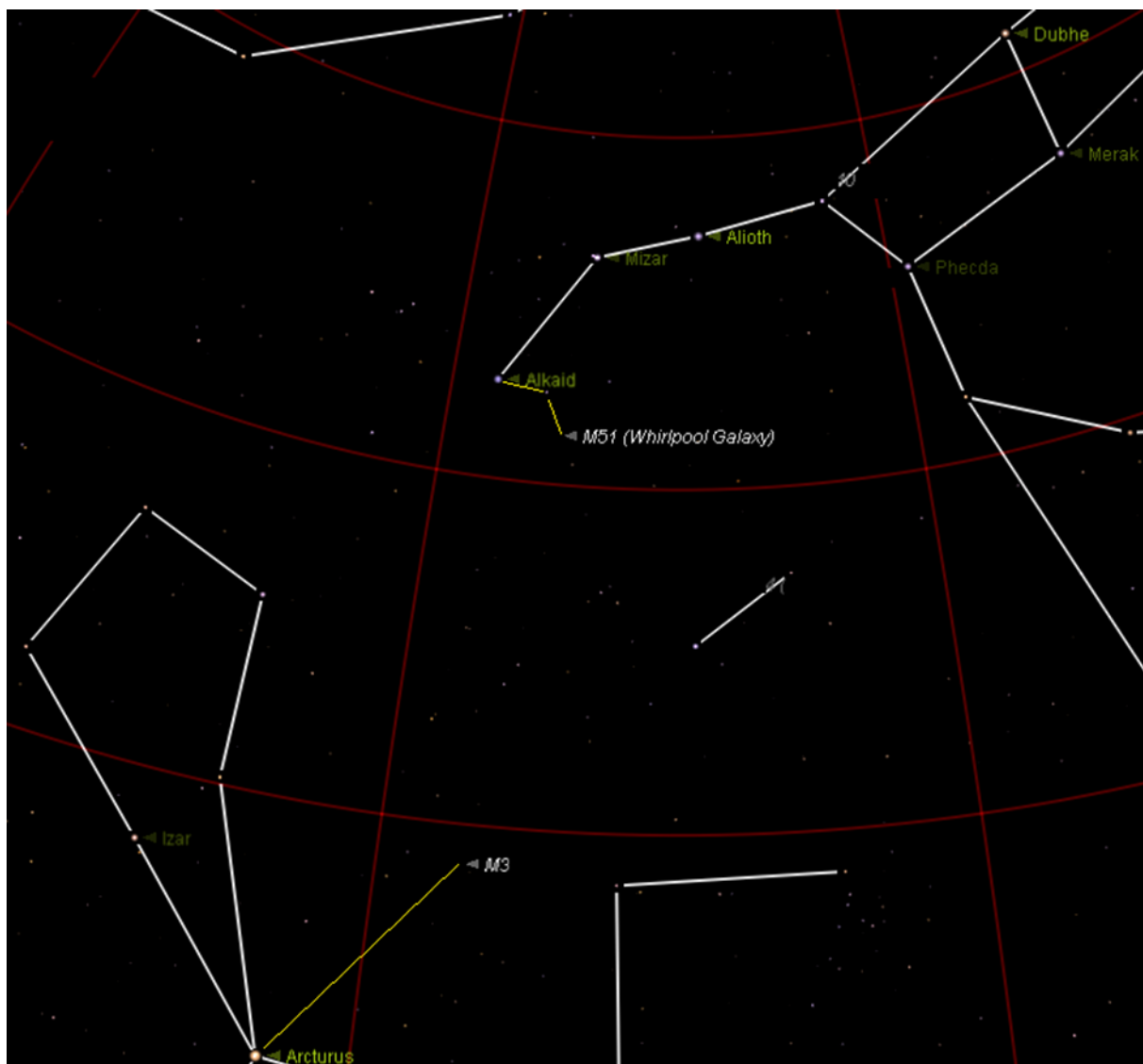
Last Quarter : 26<sup>th</sup>

Garvey Ranch Observatory gives excellent views of the moon and planets through its 8-inch scope. Some deep sky objects are also visible, with more objects visible with the imaging telescope. The most visible objects are star clusters. They are part of the Milky Way galaxy, and therefore are close and relatively bright. But if conditions are favorable, there are other deep sky objects that might be visible through the Garvey Ranch scopes.

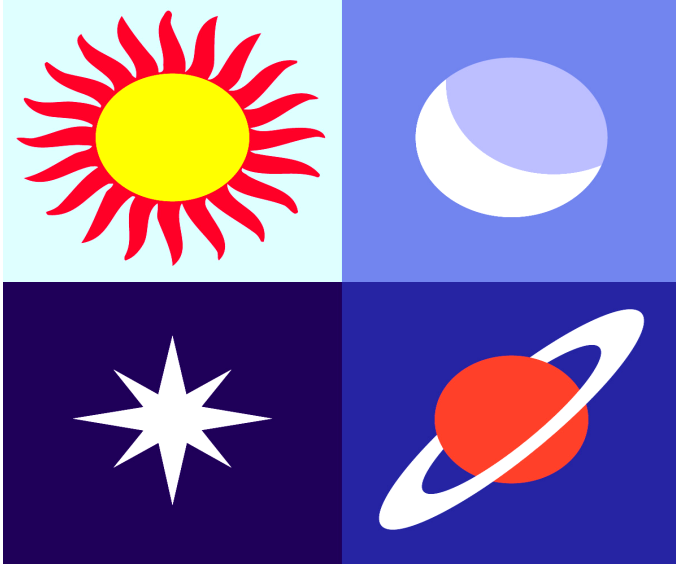
One possibility is Messier-51, known as M-51. Charles Messier, a French amateur astronomer, made this list in the early 1800s, to avoid confusing these objects with the comets he wanted to find. M-51 is a spiral galaxy, but all that will be seen through the 8-inch scope is the core, looking like a fuzzy star. We might see more with the camera on the 4-inch telescope. It's southwest of the star at the end of the handle of the Big Dipper. With an 8x50 finder, you will glimpse another star to the east, fainter than the end-handle star. Now form a triangle as shown; M51 is a faint glow or two at the imagined third point of the triangle.



Another possibility is M-3, a dense collection of stars known as a globular cluster, because it looks like a ball of stars. We might see some of this in the 8-inch, but again, the 4-inch should capture more with its camera. It's a little harder to find than M51. Go 5 degrees northwest of Arcturus along the line to the two stars of Canes Venatici, the two hunting dogs. That's about  $1/3^{\text{rd}}$  of the way to those two stars. To find Arcturus, use the old method of following the stars in the handle of the Big Dipper as they curl away from the bowl, then "arc to Arcturus".



# Almanac



**May 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 22:46 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.

**May 6, 7 - Eta Aquarids Meteor Shower.** The Eta Aquarids is an above average shower, capable of producing up to 60 meteors per hour at its peak. Most of the activity is seen in the Southern Hemisphere. In the Northern Hemisphere, the rate can reach about 30 meteors per hour. It is produced by dust particles left behind by comet Halley, which has been known and observed since ancient times. The shower runs annually from April 19 to May 28. It peaks this year on the night of May 6 and the morning of the May 7. The thin crescent moon will set early in the evening leaving dark skies for what should be a good show. Best viewing will be from a dark location after midnight. Meteors will radiate from the constellation Aquarius, but can appear anywhere in the sky.

Need Help With A New Telescope?

Visit the Garvey Ranch Observatory on any Wednesday night 7 PM to 10 PM for tips and assistance from your fellow LAAS members. **This is a free event for the public.**

Learn more: [The Garvey Ranch Park Observatory](#)

**May 18 - Full Moon, Blue 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 21:11 UTC. This full moon was known by early Native American tribes as the Full Flower Moon because this was the time of year when spring flowers appeared in abundance. This moon has also been known as the Full Corn Planting Moon and the Milk Moon. Since this is the third of four full moons in this season, it is known as a blue moon. This rare calendar event only happens once every few years, giving rise to the term, "once in a blue moon." There are normally only three full moons in each season of the year. But since full moons occur every 29.53 days, occasionally a season will contain 4 full moons. The extra full moon of the season is known as a blue moon. Blue moons occur on average once every 2.7 years.

Source: <http://www.seasky.org/astronomy/astronomy-calendar-2019.html>

Looking for more astronomy events? Check out Griffith Observatory's calendar by visiting their website:

<http://www.griffithobservatory.org/programs/calendar.html>



# MAY 2019

Sun	Mon	Tue	Wed	Thu	Fri	Sat
			1 Garvey Night	2 Outreach - Torrance	3	4 Dark Sky Night 60 Inch Mt. Wilson
5	6	7	8 Garvey Night Board Meet- ing	9	10 Outreach - Chatsworth	11 "Lockweed!" (Clean-up Day at Lockwood)
12	13 General Meet- ing	14	15 Garvey Night	16	17 Outreach - Temple City	18 Public Star Party
19	20	21 Outreach – Reseda	22 Garvey Night	23	24	25
26	27	28	29 Garvey Night	30	31	

Additional events with updated information may be posted on the calendar. Please log on to your account on the Night Sky Network (NSN) to view the complete schedule of club events. Link: <https://nightsky.jpl.nasa.gov/>

## 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](mailto: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](https://nightsky.jpl.nasa.gov/club-eventrequest.cfm?Club_ID=1344)

## LAAS Club Swag

### 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](mailto: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>



## 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/>



**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 returned 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

## 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.

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## Club Contacts

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**LAAS Message Phone:**

213- 673-7355 (Checked daily)

**Griffith Observatory:**

213-473-0800

**Sky Report:**

213-473-0880

**Lockwood Site:**

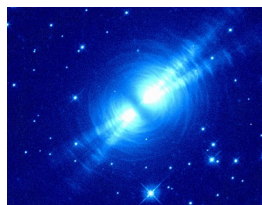
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