



## THE LOS ANGELES ASTRONOMICAL SOCIETY

# THE BULLETIN

MARCH, 2018

VOLUME 92, ISSUE 03



A Cessna aircraft appears to cross the eclipsed moon captured on Jan. 31, 2018. This occurred during the Total Lunar Eclipse presented by the Griffith Observatory in Los Angeles, CA.

### Seeking Volunteer Opportunities In the LAAS?

We need writers, thinkers, movers, and shakers! Blend new ideas with old and make a difference! Write articles for our website and newsletter, take photos at events, help our telescope operators with the public, use astronomy props to teach the public about the cosmos. Email [Coordinator@LAAS.org](mailto:Coordinator@LAAS.org) for more info.

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### Dates To Remember:

Board Meeting: Mar. 7, 2018

General Meeting: March 12, 2018

Public Star Party: March 24, 2018

Complete calendar on Page 21

# Volunteer Honor Roll

## 2017

*The following club members were acknowledged for their volunteer efforts in 2017, at our annual banquet held in January, 2018. These are members who volunteer in various aspects of the club including participation in Outreach events, public star parties, managing the club's social media outlets, contributing to the newsletter, working behind the public scenes, and helping other members with equipment and knowledge. Congratulations to All!*

Aguilar, Jose	Kunioka, Todd	Sovereign, Dave
Ashelford, Luis	Kunitani, Penny	Steenhoek, Larry
Attias, David	Lathrop, Bruce	Sunada, Shirley
Blumhorst, Ray	MacCallum, Mike	Thompson, Mark, Carolyn and Greg
Breaux, Sheri	Nakamoto, Dave	Thompson, Pam
Byrom, Curtis	Navejas, Gerardo	Thompson, Tim
Brown, Mary and Gina	Navejas, Jethro	Tyree, Vance
Chilton, Lew and Carla	O'Bryan, John	Vargas, Norm
Colon, Javier	Ogle, Michael	Ventimiglia, Matt
Dashiell, Steve	Paget, Bruce	Volk, Chris
De Gregori, Don	Pearlstein, Douglas	Von Wendt Robert and Rosalie
Dempsey, Ed	Phipps, Joe	Webster, Van
Dobrovics, Zoly, Krisztana, Andras and Attilia	Pinsky, Dave	White, Mike
Dooley, Darrell	Powers, Ken	Wong, Elizabeth
Dominique, Jean	Rahbari, Jeremy	Woods, Jim
Dye, Jody	Renteria, Heven	Wu, Robert
Fisanotti, John	Rochford, James	
Germaine, Al	Rosales, Manual	
Gilchrist, Kevin	Roosman, Richard	
Gollnick, Dan	Russ, Tim	
Hacobian, Aram	Rubacalja, Alex	
Hurst, Aicia	Andee Sherwood	
Jeevanjee, Nasir	Silvera, Richard and Susan	
Karch, Carole	Smudde, Mary	
Keen, Paul	Somoza, Geovanni	
Komoto, Rob	Soohoo, Spencer	



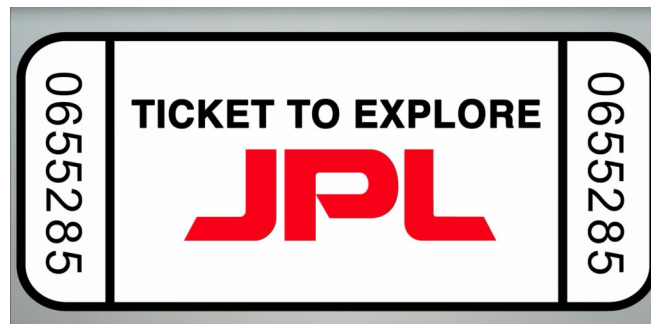
# JPL Open House

## June 9-10, 2018

Sign up for JPL's mailing list to be contacted when the tickets are available for their Open House event in June.

Last year, the tickets were made available on March 11th at 9 AM. This year? March, April, or May? Only JPL knows!

Tickets are non-transferable so you won't be able to use someone else's ticket if you can't get your own.



Sign up using this link: <https://www.jpl.nasa.gov/signup/>

Video Link: JPL Open House 2017

<https://www.youtube.com/watch?v=9eAFerUcQso>

JPL Contact Information-Public Services Office

4800 Oak Grove Drive  
Jet Propulsion Laboratory  
Mail Stop 186-113  
Pasadena, CA 91109

Phone: (818) 354-1234

[› Directions to JPL](#)



# A Super, Blue, Blood Moon

By Ray Blumhorst

A 99.9% full moon appeared large in the sky on January 31, 2018, because it was at the closest point to Earth in its orbit (perigee). A full moon in perigee is called a Super Moon.

When two full moons occur in one month, the second full moon is called a Blue Moon.

When the moon is at a position in its orbit where it's a full moon, but the Earth is in a position where it blocks the light of the Sun, a Lunar Eclipse occurs. Such a moon is called a Blood Moon.

Since all three of the astronomical events described above occurred on January 31, 2018 in the Los Angeles area, many Los Angelinos were privileged to witness a rare "Super, Blue, Blood Moon."



On January 30, a 99.1% full moon blazed away low in the eastern sky at 7:34 p.m. - less than 12 hours away from the Super, Blue, Blood Moon. Taken through a window, the photo shows a ghost image of the moon reflecting off the windowpane.

I awoke around 5:00 a.m. January 31st, after sleeping through an earlier alarm setting. The Super, Blue, Blood Moon was already low in the morning atmosphere ( $15^{\circ} 25'$  altitude), and I'd missed the 1st portion of the partial (penumbral) lunar eclipse, when Earth's shadow increased and the moon darkened.



I took my first photo at 5:33 a.m., four minutes after the peak of the total (umbral) lunar eclipse.



At 6:07 a.m. the total lunar eclipse ended and the 2nd portion of the partial lunar eclipse began so all photos after 6:07 a.m. show the moon progressively getting brighter and brighter.



At 6:12 a.m., a plane taking off from Van Nuys Airport flew through the picture frame, and added two red streaks from two red wing lights (constantly on), and added one white dot from a flashing wing light.



The last photo of the 2nd portion of the partial lunar eclipse was taken at 6:20 a.m. At that time, the moon was very low in the soup of the morning atmosphere ( $6^{\circ} 18'$  altitude) and just above the treetops, and roofline of a one-story house across the street.

The bright crescent on the left of this full moon is out of Earth's blocking shadow. The reddish portion on the right of this full moon is still in Earth's blocking shadow, and is the portion of the moon being partially eclipsed at this moment in time.

The penumbral lunar eclipse ended at 8:08 a.m., but in L.A., the moon set at 6:57 a.m. so the end of the eclipse was not visible in L.A.



# Jupiter and the Moon

By Ed Andrews

The pre-dawn darkness of Los Angeles  
Presented a rich clear vision.  
The city lights were all bright, distinct  
Points piercing the post-storm, clear sky.  
You could see forever this morning,  
In this stunningly clear air.

A crescent moon was high in the  
South east sky,  
The thin crescent welcoming, beaoning  
The new dawn, the following sun.  
Just below, just to the side of  
The moon shone Jupiter,  
A brilliant point of light,  
Trying to rival that glow of the moon.  
The connection of the two was as of  
Lovers,  
Lovers of that dark sky.

Hafiz, the 14<sup>th</sup> Century Persian poet  
Entered my mind.  
A poem of his awoke in me.....

“It happens all the time in heaven,  
And some day

It will begin to happen  
Again on earth –

That men and women who are married,  
And men and men who are  
Lovers,

And women and women  
Who give each other  
Light,

Often will get down on their knees

And while so tenderly  
Holding their lover's hand,

With tears in their eyes,  
Will sincerely speak, saying,

"My dear,  
How can I be more loving to you;

How can I be more  
Kind?"

I saw the crescent moon and Jupiter  
Playing out the drama of Hafiz.

Jupiter was kneeling before the  
Moon,  
Looking into the moon's eyes,  
Holding the moon's hand,  
Saying to the moon,  
"What can I do for you,  
What can I do to be more loving,  
More caring?"

I am as Jupiter now, before you,  
And you are my Moon.

---



# Outreach Report

## Van Webster

Aldama Elementary School

Highland Park

Friday, February 16, 2018

5:30 – 7:30 PM

A small troop of Los Angeles Astronomical Society members traveled to Highland Park for an evening of stargazing at Aldama Elementary School. A visit to this campus has become a regular stop in February for the LAAS outreach team.

The school is set in a hilly portion of North East Los Angeles. The main school building fronts on Avenue 50 and then the property drops dramatically in elevation as you move westward. Tall trees surround the playground and there is a steep hillside rising up to the west with multiple houses lodged between heavy foliage. The setting feels much like a European mountain village.

Highland Park, where I have lived for more than 40 years, is a dynamic community that is undergoing rapid gentrification. The night life along York Boulevard bustles with large groups of people walking from restaurant to shopping and street vendors. Music can be heard from the nightclubs along the street and lighting of all types tint the fashions on the passersby.

The diversity of the neighborhood is reflected in the families and students at Aldama Elementary School. Artistically inclined parents and inquisitive children make up the Aldama community. Conversations at the telescopes were wide ranging and engaging.

The night was clear and the weather was relatively warm for a February night. The viewable sky was limited by the buildings, trees and terrain. The moon was not visible in the west. Targets for the night included Sirius, Betelgeuse, M 42, M45, and the planet Uranus. Bright sodium Vapor lights on the side of the school building made for less than optimum viewing conditions on the playground but the students and families enjoyed what they could see. I found that a sky glow filter helped to make the nebulosity of the Orion Nebula more visible to our guests.

The astronomers were offered hot drinks and sweet snacks as they staffed their instruments. By 7:15 PM most of the crowd had headed home for dinner and the astronomers packed up their gear and headed off into the night.

Photo Credit: Van Webster





# Eclipse Trip, 2017

## Report by Jack Eastman

August 21, 2017 Eclipse trip!

Bruce Watson, team leader, Cousin John Holston, Navigator, Gerry Frank, Yours truly tag alongs, Dave Zielsdorf. (tree doctor and restorer of old, rusty telescope) accompanied us as well.

The plan was to head for Nebraska, N of Scottsbluff, perhaps somewhere along Highway 71. It runs North then a curve to the East, this curve is very close to the centerline. (I'll call it "centerline curve") Bruce Watson found a sideroad, Watson Rd., interestingly enough, about 3.85 miles South of the aforementioned curve.

Sunday, mid-morning we got everybody rounded up, Dave was going to follow us out, and we headed out on I-76 to Ft. Morgan, then N to Scottsbluff, on North to check on Bruce's proposed site, Watson Rd. 3.85-m S of 71 turn to the East. (centerline curve) 0.9 miles S of centerline. (Bruce mentioned if there's trouble with the Patrol or whatever chasing us off, he'd tell 'em "It's my road!" I also suggested that "If you hassle us, we'll make the Sun go away!") we were located at Lat. +42.223660, Long - 103.626755 (John's GPS) about 0.9 mile South of the centerline.. Probably cost us about half second of Totality Plenty close enough! The plan was to go a bit further North and camp somewhere, maybe Toadstool Geologic Park, we had done this some years before.



Bruce Watson (Orange shirt from Cabo, '91 eclipse) under "his" road sign, and Yours Truly

We decided to try Ft. Robinson State Park. some 51.72-m from site, Turns out, we later we learned, Toadstool was over filled!

<http://outdoornebraska.gov/fortrobinson/>

[https://en.wikipedia.org/wiki/Fort\\_Robinson](https://en.wikipedia.org/wiki/Fort_Robinson)

Continued on next page...



This proved to be a great choice, they had added about triple the area as overflow camping. After Bruce's typical gourmet dinner we settled in. I brought only a pipsqueak 40-mm refractor on a kluged up camera tripod. (wanted to travel as light as possible) Weather was good, clear night, Milky Way nice. I was able to show a few of the nearby campers Jupiter and Saturn, although it was only a 40-mm they did see Jupiter, its moons and the rings of Saturn. I got a bit of a scare later on, I popped awake to a totally overcast sky! Oh, no! sure hope this goes away before tomorrow's show! It did! One fellow camper said he'd just stay at Robinson and watch the partial. We tried to convince him that a partial, even a 99.99% is like a kid screeching out "Mary Had A Little Lamb" on the fiddle or butchering "Chopsticks". The Total is the Mahler 8th, "Symphony of 1000" Beethoven's 9th "Choral" or the Brahms "German Requiem"! And it's only about 50-miles to totality!

Next morning, after another of Bruce's gastronomical delights, we headed out, the 51.72-mi from Ft. Robinson, went in about a mile or so on Watson road, where I managed to sink Bruce's car in soft sand. Aaugh! A group nearby got us unstuck, and all was well. The group that unstuck us were from the Ft. Morgan/Sterling Colorado area, Don had a nice Celestron orange tube C-8 with a full aperture Solar Filter. A very nice image, beat the stuffing out of my 40-mm! Yes, Aperture is everything! Weather: rather hazy (wildfire smoke?) may have compromised the contrast in the corona, but otherwise cloudless, seeing relatively good. Old Sol was sporting several sunspotgroups that added a bit more interest. We followed the partial phases watching as the "dragon" gradually ate the Sun, then Bang! Totality. Spectacular! filters off, a couple of nice prominences,

beautiful coronal streamers. No shadowbands, I didn't see any stars, only Venus, blazing brightly to the west (right) of the Sun. Bruce tried opaque eye patches, a "sleep mask", in order to get dark adapted, took 'em off right after totality began, but didn't see anything other than Venus. Probably too much scatter from the haze/smoke made the sky just too bright. Bruce measured a 12-degree temperature drop from about midway through the partial phase until a bit after Totality. Josh, Dave's tree business partner, went somewhere in Wyoming, not Casper, said he measured a 20-degree drop.

Animal behavior, not much! no animals of any consequence. Some thought they heard a couple of crickets start to chirp. As I watched with the 40-mm the moon was receding, un-



David Zielsdorf (Green shirt) and me, F. Jack at the mighty 40-mm refractor.

covering more and more of a very nice loop prominence. Then the pinkish-red glow of the chromosphere and a sudden really bright light! Diamond Ring! Filters back on, and we watched a bit more of the partial phase. Our newly found friends broke out the champagne, Bruce cracked some Cuervo, from the Cabo San Lucas 1991 eclipse, and we toasted our good fortune with this one..I photographed the seeds outta Lewistown, 1979, so for this one I decided to just sit back and enjoy!! Bruce's tradition is to acquire some potent potable at an eclipse, and celebrate the next one with that! One of the fellows in the Ft. Morgan group is also an amateur vintner, so next eclipse we'll no doubt have some sort of 2017 vintage! then we packed up and headed out. A terrific show!! About a week later one of our local craft breweris served up "The Path of Totality Scottish Black Stout" One of their very best. It only lasted a couple of weeks.

Continued on next page...

When we got near the centerline, there were quite a few others parked along the road, no problem with "no parking", closed roads or bumper-to-bumper crowds, plenty of room, I'd guess around a hundred or so folks spread out over several miles I'm guessing maybe 7 or 8 cars per mile North and East of centerline curve, maybe a dozen/mile South of centerline curve. with a bit of a concentration at the centerline curve. Certainly not at all crowded!

Traffic?---

Going, no problems or slowdowns, after we got into Nebraska we did notice almost every car heading North had Colorado plates (guess where and why they were here?)

Return, slowdown at Scottsbluff. Clot leaving Scottsbluff, bailed out and got around it.

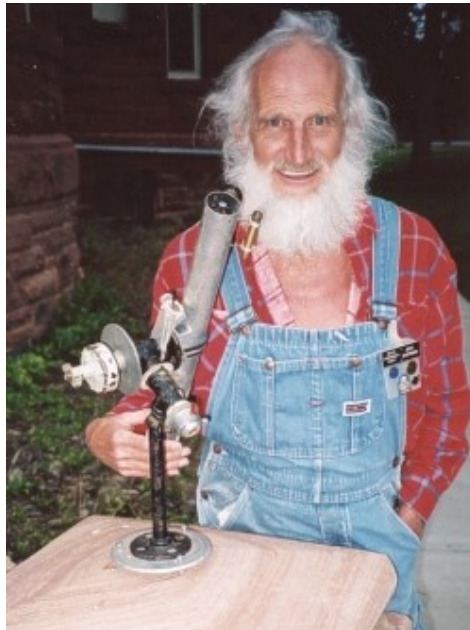
Terminal jam in Kimball, 1.68 miles @ < 2 mph when we were moving. Moving maybe only 20% of the time!

We thought getting on I-80, alleged to be plugged up w/construction When got close, noticed off ramps were well backed up but cars moving just fine on 80, Jam on 71(?) as far as eye could see to the South, so we bailed out onto I-80, no more problems. Off at 214 E of Cheyenne on to 85, speed limit +(classified)%. (If that jam on 71 went all the way to Ft. Morgan on, trip would have been ~48-hours or even much more!) Numerous police directing traffic at Scottsbluff and in Kimball as well.

Trip, Declared a stunning, not Howling, success! Seems when totality hits everyone screams, cheers, howls at other eclipses, but here dead silence!, (except for the aforementioned crickets)

Bring on the next one!!

Jack Eastman



# Session Nights

## Mt. Wilson Observatory

2018 Session Schedule:

- April 14th (Sat)
- May 5th (Sat) **100 Inch Night**
- June 9th (Sat)
- July 7th (Sat)
- August 4th (Sat)
- September 7th (Fri)
- October 5th (Fri)
- November 3rd (Sat)
- December 1st (Sat)

The price 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 the LAAS members, families, and 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  
 2800 E. Observatory Road  
 Los Angeles, CA. 90027

ATTN: Treasurer/Mt. Wilson

\*Please write "60 Inch" or "100 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.*



60 Inch group photo from April, 2017



# RTMC 2018 - Riverside Telescope Maker's Conference

## May 24th - May 28th

### Registration and General Information

This year is the RTMC Astronomy Expo's 50<sup>th</sup> Anniversary! We are planning to "do it big" to celebrate! David Levy will be speaking, as will a great slate of speakers all day Saturday and Sunday.

## REGISTRATION IS OPEN!

Go to [rtmcastronomyexpo.org](http://rtmcastronomyexpo.org)

Why should YOU plan to come to RTMC-AE?

Because:

- 1 – Numbers! We have more attendees than any other Astronomy event on the West Coast. We had 550 last year, and it continues to grow. We're expecting a bump this year with the 50<sup>th</sup> anniversary. And we have no residency restrictions.
- 2 – Low Cost! We're one of the most reasonably-priced Astronomy Expos. Children under 17 are FREE and college students with ID are half-price.
- 3 - Activities! It's a YMCA camp, so there's a lot to do for everyone besides all the Astronomy events. But we do have workshops, lectures, star parties, a great swap meet (free to sell your goodies!) and Vendors for the Astronomers in the bunch.
- 4 - Kid's Stuff! We're actively working to bring youngsters into Astronomy! We have Children's activities and the Kid's Ice Cream Social on Sunday afternoon.
- 5 - Beginner's Corner! An active and expanding program for the new Astronomer, all the basics one needs to know to get started!

We'll see you here Memorial Day Weekend 2018!!

Cheers-

Teresa and the RTMC-AE Board  
Questions? Email [teresa@lbt.org](mailto:teresa@lbt.org)



Follow the link below to view the

RTMC 2018 Brochure:

<http://rtmcastronomyexpo.org/wp-content/uploads/2017/09/brochure.2018.pdf>

# Meet The New Members

## Welcome to the LAAS!



Brian Linse

John and Mary Tufo

Daniel Low

Devin Jackson

Hiroshi Watanabe

Angelica Conde

Daniel Joo

Daniel Kim

Davit Grigoryan

## 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.

**NEW:** You may listen to recorded meetings by logging in to our website at LAAS.org and clicking on the "Members Only" tab.

Before you try to access the "Members Only" information, you need to request login credentials from our Webmaster. On the left hand side of the page, scroll down and find "Login." Click "Login" for further information.

## 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).



# A Guide To The Night Sky

## Tre Gibbs



Spring arrives at 9:15 am on the morning of March 20th. This is known as the Vernal (or Spring) Equinox. The word *Equinox* is a Latin term which means “*equal night*”. On this day, Earth’s northern and southern hemispheres both receive equal amounts of day and night AND as a visual testament to this occurrence, the sun rises due east and sets due west - again on this day only. The very next day, the sun will rise and set just slightly north of due east and west, respectively, and our days will officially become *longer* than our nights. For our neighbors south of the equator (in the southern hemisphere), this day marks the beginning of Autumn and the days there begin to get shorter while their nights get longer.

Back in the northern hemisphere, the sun will continue to rise and set further north until June 21st, The Summer Solstice, at which point the sun will stop moving north, turn around and start heading back south, reaching it’s midpoint on September 22nd (The Autumn Equinox), then continuing on to it’s southern most point on December 21st, The Winter Solstice. The cycle continues, back and forth, on and on, and so it goes...

Earth’s natural satellite, the Moon, is approximately 239,000 miles away from Earth and orbits our planet every 28 days or so. Our word “Month” comes from “Moon”, as does “Monday”. The Moon also travels the same, narrow path in the sky as the planets, which makes the moon a useful tool in finding the planets. Two full moons this month - just like January! One on the 1st and the other on the 31st. I guess “Blue Moons” aren’t that rare after all...

The word “planet” is derived from the Greek word, “*planeta*” which means “*wanderer*”. Ancient astronomers noticed that seven lights moved - or wandered - through the sky: The Sun, Moon, Mercury, Venus, Mars, Jupiter and Saturn, which is why we have seven days of the week. The other planets, Uranus and Neptune, require a telescope, or at least a good pair binoculars, to see them. Although planets do resemble stars, there are a few differences that help the novice sky-watcher identify which is which. First of all, planets tend to be brighter than stars. Because they are brighter, they tend to be the first objects to appear as the sky darkens. This could be part of the reason why a lot of wishes are not coming true for people. Remember this poem?

*Star light, star bright,  
First star I see tonight  
I wish I may, I wish I might,  
Have this wish I wish tonight.*

You see, most people are wishing on planets rather than stars and thus, said wishes fail to come true. Another difference is that stars twinkle but planets do not. The reason? Planets are a lot closer to us than the stars and therefore appear as disks of light rather than pinpoints of light, which are more susceptible to the bending and distortion from Earth’s turbulent atmosphere. Our eyes detect that bending and distortion of light as “twinkling” or, if you prefer, the more scientific term, *scintillation*.

Speaking of planets, Jupiter - the mighty King of the Gods, rises around 12:30am early in the month and around 11:30pm at month’s end, and will be the brightest thing in the eastern sky, after the moon. On March 7th, use the moon to find Jupiter - on this night only, it will be the bright, steady light just to the right of the waning crescent. Mars and Saturn follow Jupiter, but not until three and four hours later, respectively. On the morning of March 10th, the moon will have positioned itself practically equidistant between Mars and Saturn. Although, at month’s end, in the wee hours of March 31st, the moon will be gone and Mars will have caught up to Saturn, both rising in the ESE around 3:00 am as a pair of cosmic “eyes” staring down at us...Mars to the right, Saturn to the left. Set your alarm clock and check it out - weather permitting!

Have a safe and wonderful change of seasons and as always... KEEP LOOKING UP!

Tre Gibbs/LAAS

# ALMANAC

- March 2 - 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 00:51 UTC. This full moon was known by early Native American tribes as the Full Worm Moon because this was the time of year when the ground would begin to soften and the earthworms would reappear. This moon has also been known as the Full Crow Moon, the Full Crust Moon, the Full Sap Moon, and the Lenten Moon.
- March 15 - Mercury at Greatest Eastern Elongation.** The planet Mercury reaches greatest eastern elongation of 18.4 degrees from the Sun. This is the best time to view Mercury since it will be at its highest point above the horizon in the evening sky. Look for the planet low in the western sky just after sunset.
- March 17 - 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 13:12 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.
- March 20 - March Equinox.** The March equinox occurs at 16:15 UTC. The Sun will shine directly on the equator and there will be nearly equal amounts of day and night throughout the world. This is also the first day of spring (vernal equinox) in the Northern Hemisphere and the first day of fall (autumnal equinox) in the Southern Hemisphere.
- March 31 - 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 12:37 UTC. Since this is the second full moon in the same month, it is sometimes referred to as a blue moon. This year is particularly unique in that January and March both contain two full moons while February has no full moon.

Source: <http://www.seasky.org/astronomy/astronomy-calendar-2018.html>

## Need Help With A New Telescope?

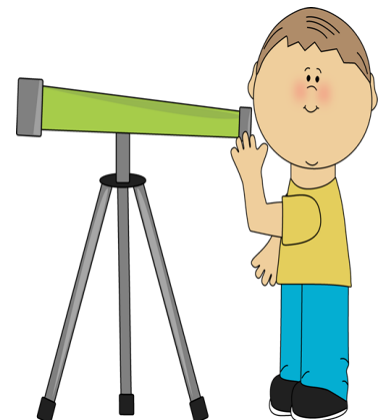
Visit the Garvey Ranch Observatory on any Wednesday night 7 PM to 10 PM for tips and assistance by your fellow LAAS members.

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



Rewarding!  
Fulfilling!  
Fun!

Be a part of something great!  
Join our Outreach team  
of volunteers today.  
Contact Heven Renteria,  
our Outreach Coordinator  
at  
[Outreach@LAAS.org](mailto:Outreach@LAAS.org)





# Event Calendar

Sun	Mon	Tue	Wed	Thu	Fri	Sat
				1 <b>Outreach Torrance</b>	2	3
4	5	6	7 <b>Garvey Nights Board Meeting</b>	8	9 <b>Outreach Culver City</b>	10
11	12 <b>General Meeting</b>	13	14 <b>Garvey Nights</b>	15 <b>Outreach Arcadia</b>	16	17 <b>Dark Sky Night</b> <b>MWO PSP</b>
18	19	20	21 <b>Garvey Nights</b>	22 <b>Outreach Norwalk</b>	23 <b>Outreach Sierra Madre</b>	24 <b>Public Star Party</b>
25	26	27	28 <b>Garvey Nights</b>	29	30	31

## Astronomers' Blessing

May your skies be clear and dark.

May your telescopes be steady and dry.

May your eyes find all the objects they seek

In the darkness of the sky.

Happy St. Patrick's Day!

*Andee Sherwood, Editor*



Everyone's Irish  
On March 17th.



# What Is the Ionosphere?

By Linda Hermans-Killiam



High above Earth is a very active part of our upper atmosphere called the ionosphere. The ionosphere gets its name from ions—tiny charged particles that blow around in this layer of the atmosphere. How did all those ions get there? They were made by energy from the Sun!

Everything in the universe that takes up space is made up of matter, and matter is made of tiny particles called atoms.

At the ionosphere, atoms from the Earth's atmosphere meet up with energy from the Sun. This energy, called radiation, strips away parts of the atom. What's left is a positively or negatively charged atom, called an ion. The ionosphere is filled with ions. These particles move about in a giant wind.

However, conditions in the ionosphere change all the time. Earth's seasons and weather can cause changes in the ionosphere, as well as radiation and particles from the Sun—called space weather.

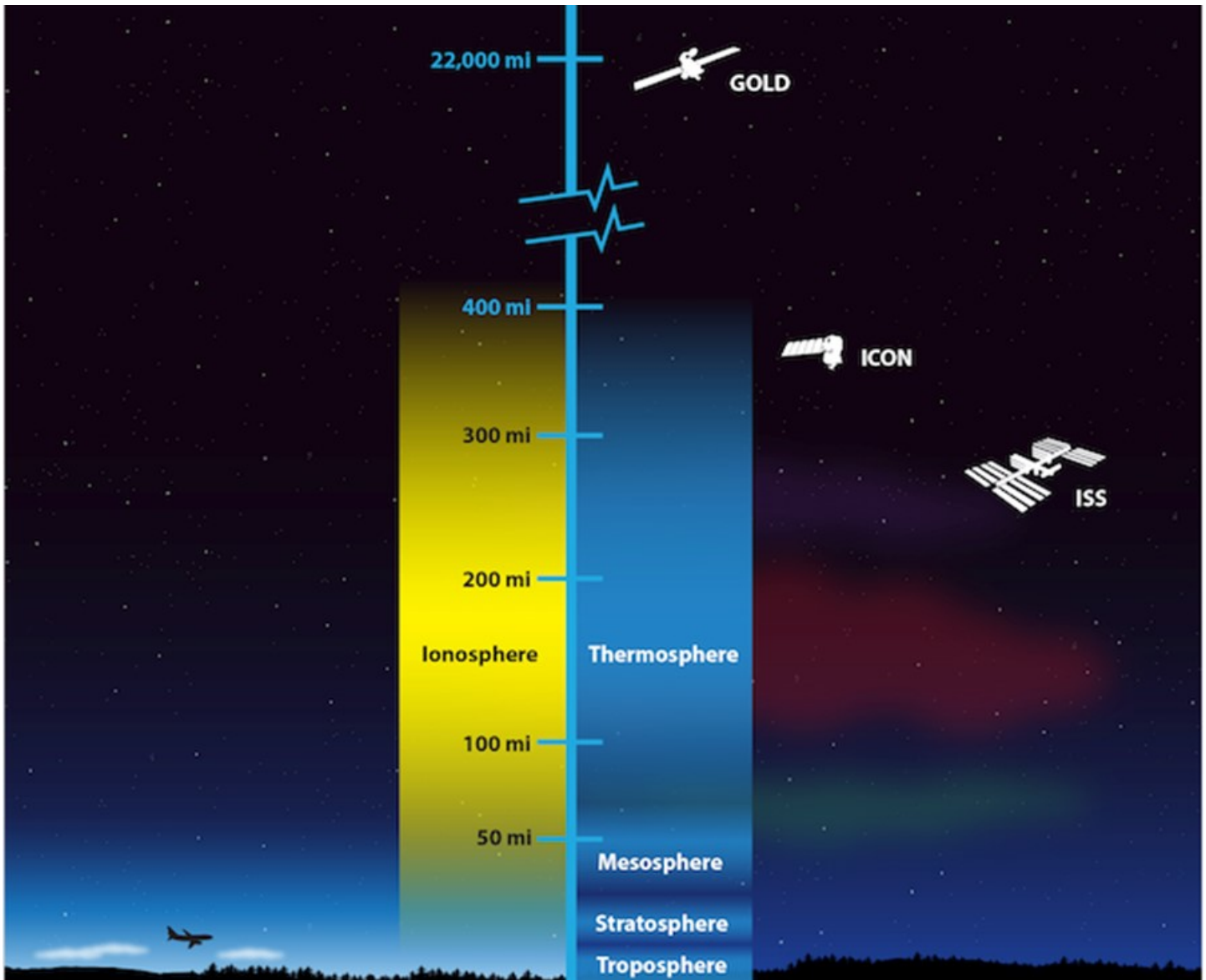
These changes in the ionosphere can cause problems for humans. For example, they can interfere with radio signals between Earth and satellites. This could make it difficult to use many of the tools we take for granted here on Earth, such as GPS. Radio signals also allow us to communicate with astronauts on board the International Space Station, which orbits Earth within the ionosphere. Learning more about this region of our atmosphere may help us improve forecasts about when these radio signals could be distorted and help keep humans safe.

In 2018, NASA has plans to launch two missions that will work together to study the ionosphere. NASA's GOLD (Global-scale Observations of the Limb and Disk) mission launched in January 2018. GOLD will orbit 22,000 miles above Earth. From way up there, it will be able to create a map of the ionosphere over the Americas every half hour. It will measure the temperature and makeup of gases in the ionosphere. GOLD will also study bubbles of charged gas that are known to cause communication problems.

A second NASA mission, called ICON, short for Ionospheric Connection Explorer, will launch later in 2018. It will be placed in an orbit just 350 miles above Earth—through the ionosphere. This means it will have a close-up view of the upper atmosphere to pair with GOLD's wider view. ICON will study the forces that shape this part of the upper atmosphere.

Both missions will study how the ionosphere is affected by Earth and space weather. Together, they will give us better observations of this part of our atmosphere than we have ever had before. To learn more about the ionosphere, check out NASA Space Place: <https://spaceplace.nasa.gov/ionosphere>.

Continued on next page...



This illustration shows the layers of Earth's atmosphere. NASA's GOLD and ICON missions will work together to study the ionosphere, a region of charged particles in Earth's upper atmosphere. Changes in the ionosphere can interfere with the radio waves used to communicate with satellites and astronauts in the International Space Station (ISS).

*Credit: NASA's Goddard Space Flight Center/Duberstein (modified)*

This article is provided by NASA Space Place.

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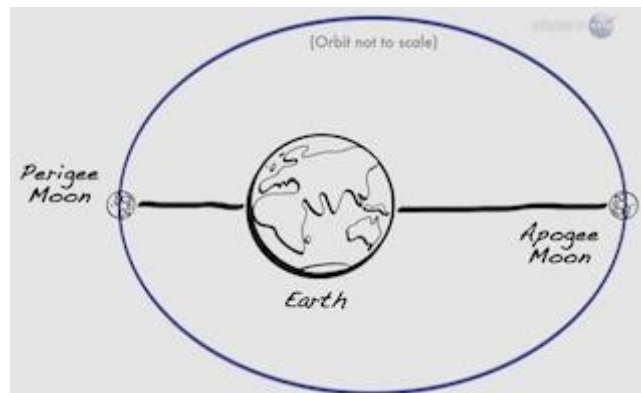


# Turn Supermoon Hype Into Lunar Learning



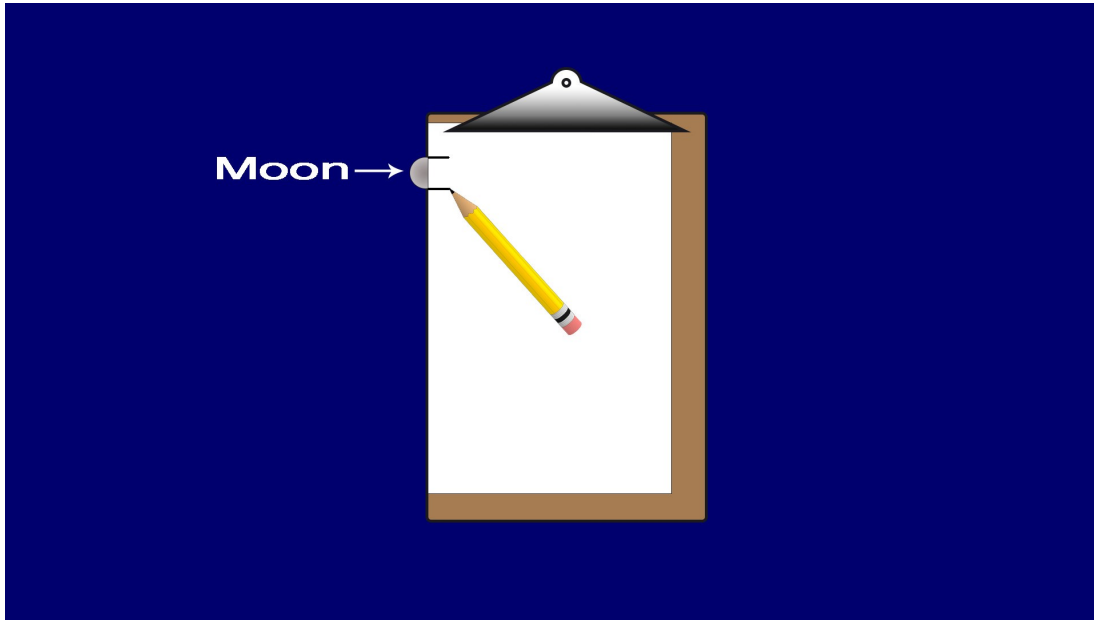
Supermoons get lots of publicity from the media, but is there anything to them beyond the hype? If the term "supermoon" bothers you because it's not an official astronomical term, don't throw up your hands. You can turn supermoon lemons into lunar lemonade for your star party visitors by using it to illustrate astronomy concepts and engaging them with great telescopic views of its surface!

Many astronomers find the frequent supermoon news from the media to misleading, if not a bit maddening. Unlike the outrageously wrong "Mars is as big as the moon" pieces that appear like clockwork every two years during Mars's close approach to Earth, news about a huge full moon is more of an overstatement. The fact is that while a supermoon will indeed appear somewhat bigger and brighter in the sky, it would be difficult to tell the difference between an average full moon and a supermoon with the naked eye.





There are great bits of science to glean from supermoon discussion that can turn supermoon questions into teachable moments. For example, supermoons are a great gateway into discussing the shape of the moon's orbit, especially the concepts of apogee and perigee. Many people may assume that the moon orbits Earth in a perfect circle, when in fact its orbit is elliptical! The moon's distance from Earth constantly varies, and so during its orbit it reaches both apogee (when it's farthest from Earth), as well as perigee (closest to Earth). A supermoon occurs when the moon is at both perigee and in its full phase. That's not very rare; a full moon at closest approach to Earth can happen multiple times a year, as you may have noticed.



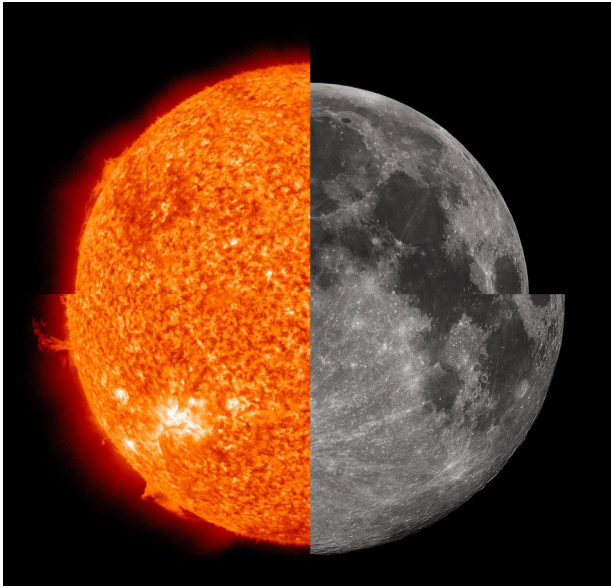
*Image of the supermoon measurement activity. (image credit: [NASA/JPL](#) )*

While a human observer won't be able to tell the difference between the size of a supermoon and a regular full moon, comparison photos taken with a telephoto lens can reveal the size difference between full moons. NASA has a classroom activity where students can measure the size of the full moon month to month and compare their results: "[Measuring the Supermoon.](#)"



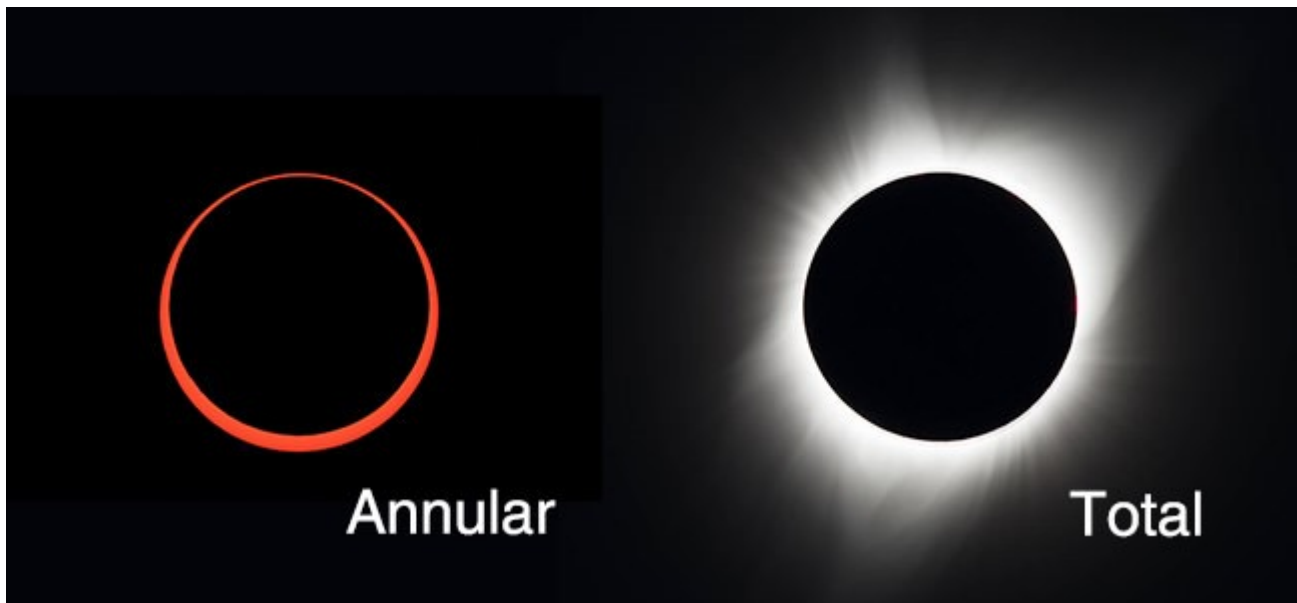
*Apparent size difference between a "supermoon" (left, full moon at perigee) and "minimoon" (right, full moon at apogee). This is an example of the comparisons curious individuals can make with a DSLR camera following this activity. Photo credit: NASA*

Student can use digital cameras (or smartphones) to measure the moon, or they can simply measure the moon using nothing more than a pencil and paper! Both methods work and can be used depending on the style of teaching and available resources. Find out more here: <https://www.jpl.nasa.gov/edu/teach/activity/measuring-the-supermoon>



*Apparent sizes of the Sun and moon depicted to scale at apogee (top right) and perigee (bottom).*

There *is* actually a way for naked eye observers to observe the different apparent sizes of the moon in our sky, but oddly enough it's not when the moon is full and brilliant, but the opposite: when the moon is new and dark, during eclipses! For eclipse chasers, the apparent size of the moon matters very much to what they will see. For example, a total eclipse can happen in conjunction with a supermoon as many in the USA saw on August 17, 2017. The apparent size of the moon was large enough to completely block the disc of the sun in our skies along a narrow path for a couple of minutes. If the moon was further away from the Earth, especially if it was at apogee- its furthest point - then a total eclipse would not occur. Instead, an annular eclipse would be seen instead, where a "ring of fire" would seem to circle the black disc of the new moon.



*Image Credits: Dale Cruikshank (Annular Eclipse)/ NASA/ Aubrey Gemignani (Total Eclipse)*

This discussion of the different phases of the moon and can also make for a fun, simple, long-term project for a classroom. Students can observe the phases of the moon every day (when weather permits) over a thirty day period and write down their observations of the moon's phases and what times of day and night they can actually see the moon during this period. This can also be paired at some point with the crafty "[Make a Moon Phases Calculator and Calendar](#)" activity. You can find out more about the "Observing the Moon" classroom activity at: <https://www.jpl.nasa.gov/edu/teach/activity/observing-the-moon>

You can find a more detailed discussion of the science of supermoons on NASA's "[What is a Supermoon and Just How Super Is It?](#)" page from their "[Teachable Moments](#)" blog. You can find links to the above activities there, along with more lunar science that can be used to make the hype about Supermoons teachable moments for your star party visitors.

*Last Updated: December 14, 2017*

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