



THE LOS ANGELES ASTRONOMICAL SOCIETY

THE BULLETIN

APRIL 2017

VOLUME 91, ISSUE 4



Here's a picture of Bode's Galaxy (M81) I took from Lockwood Valley on February 24, 2017. Telescope used was a Celestron 11" EdgeHD, with a focal reducer, making the focal length 1960 mm. Captured with a Canon T2i with a custom built TEC cooler box. The image is made up of 100 x 300sec subs taken at ISO 1600. Stacked in Nebulosity 3.0 and processed in Photoshop CS6.

Brian Paczkowski - Star Member

General Meeting

Date: April 10, 2017

Time: 7:30 PM - 9:45 PM

Location: Griffith Observatory - Leonard Nimoy Event Horizon Theater

Please check your club email for Speaker and parking information.

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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 beauties and wonders of our universe.

MT. WILSON NIGHTS ARE BACK!

Make Your Reservations Soon!

60 Inch Nights:

Friday 4/21 (Half)

Saturday 5/20 (Full night)

Saturday 6/24 Imaging Session- 4 Spots Open!

Friday 7/21 (Half)

Saturday 9/16 (Half)

Saturday 10/28 (Half) (Moon night!)

Saturday 11/11 (Half)

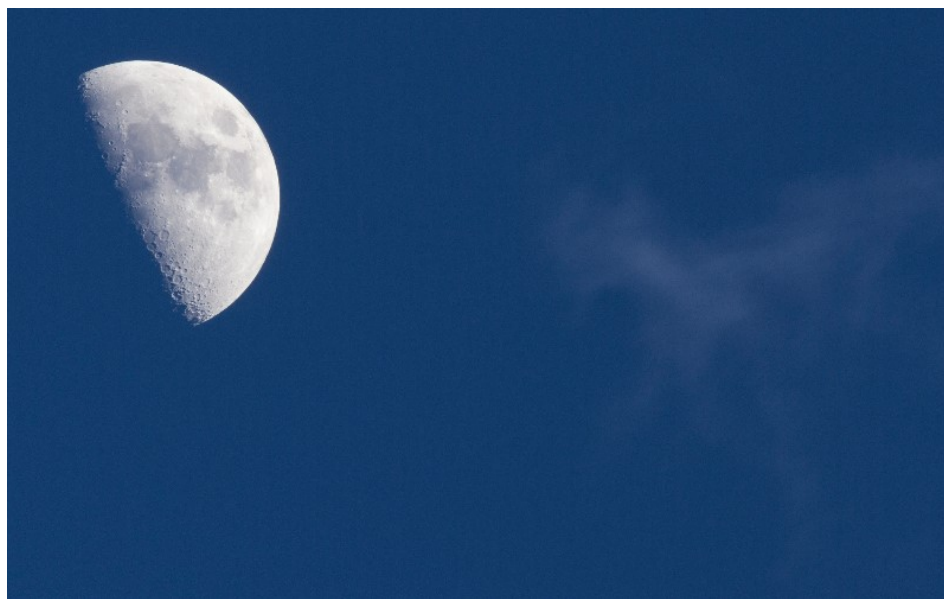
100 inch nights:

Friday 6/23 (Half)

Email Darrell before using the PayPal link to guarantee space available.

Contact Darrell Dooley at Mtwilsoncoordinator@laas.org for further information

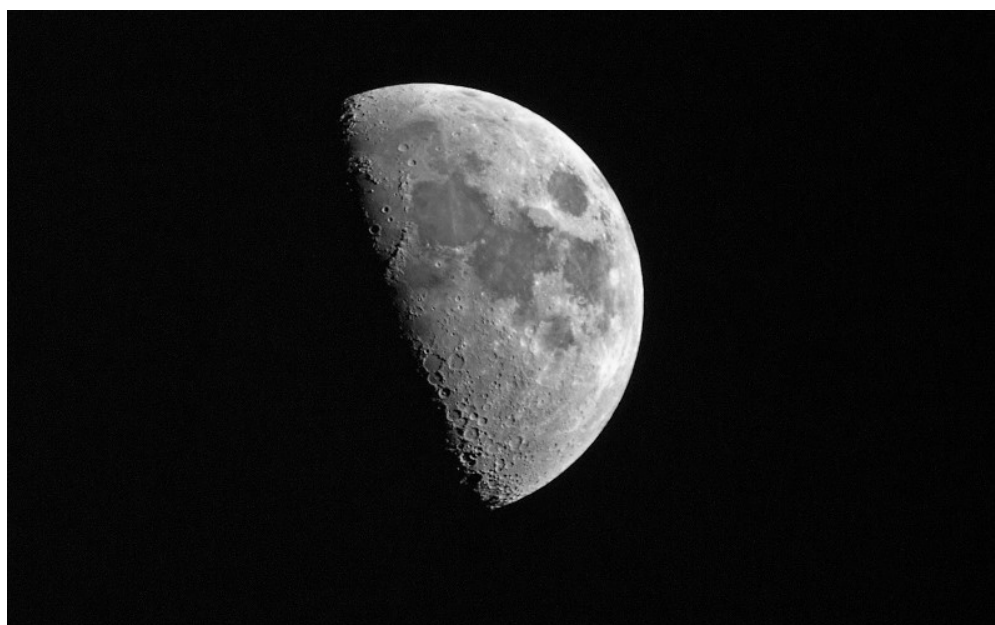
The Afternoon Moon - March 5, 2017 - Ray Blumhorst



I got out into my backyard later than I wanted to today, but still had enough time to get a little photography in after today's rain. The rain was very light and blew through quickly. I used a polarizing filter on a 400mm telephoto lens mounted in a Canon D60.

The Sun set at 5:54 p.m. today so from about 5:30 p.m. to 5:45 p.m. I photographed the Moon in the daytime sky, albeit late afternoon. The Moon was close to Zenith in the daytime sky so I wasn't sure how the polarizing filter would work as I've shot to the north and south before, but never overhead. Judging by the darkening on my live-view preview screen, it seemed to be giving most of the range of the polarizing filter effect.

In the first photo, a wisp of a cloud appears with the Moon. In the second photo, it looks like nighttime, but it was daytime. I had filter dialed in for as much polarizing effect as I could get on that second shot. I also tweaked the photos in Photoshop, since I was shooting RAW & .jpeg and always try to get a little more out of the RAW images. Ray Blumhorst/LAAS



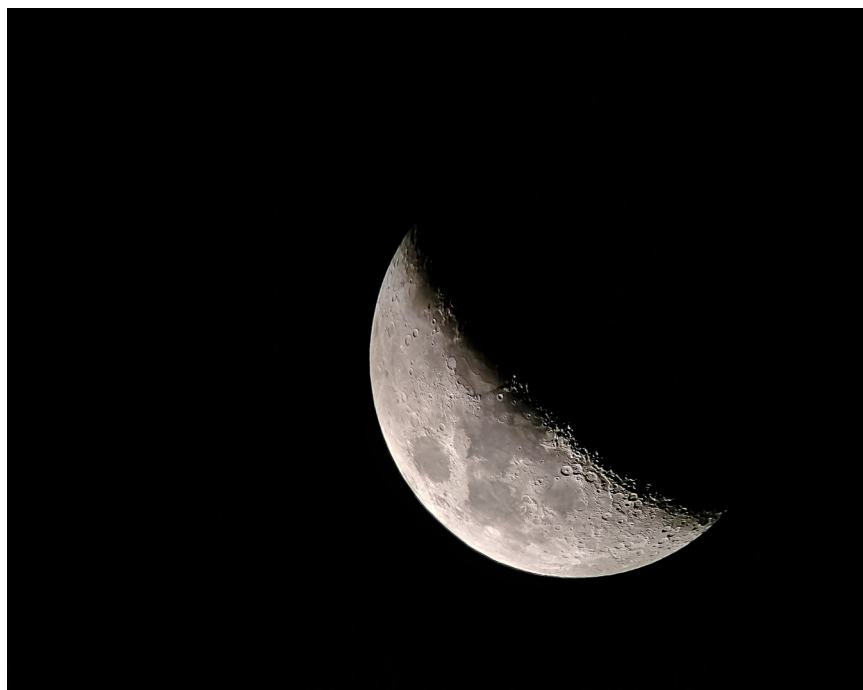
The Driveway Observatory - by Chip Louie

Here's a surprisingly good (to me anyway) photo taken with a Pixel smartphone on March 3, 2017 at 8:37 PM from my driveway in South Pasadena. We had some people over for dinner but that night the sky was amazingly clear and the air was so very still I felt compelled to observe that night after months of being cooped up inside trying to stay warm and dry. I found a way to set up a scope for a quick peek at the sky by enlisting my guests to help.



I setup my lightweight beater mount, a SkyView-Pro which I fitted with a Losmandy saddle using a Losmandy Vixen dovetail which Scott Losmandy made up for me in his shop. The SVP mount has an Oberwerk wood tripod using an adapter I CAD'd up and my son cut on a CNC mill for me. I thought to try a recent untested acquisition, a bespoke Parallax Instruments / Astro-Tech 130mm f/6 Apo with a lens cell hand picked and adjusted by Roger Ceragioli at U of Az. In a hurry to observe the crescent moon before it was lost behind trees I did not bother to polar align the mount, I just pointed it generally north. This new OTA is an observatory style instrument which is to say ugly but durable and built like a tank. It took every counterweight I could find, 24lbs and it barely balanced out the OTA on the mount. The SVP mount is a lightweight mount with a maximum payload of 15-20lbs on a tripod with a 40lb. limit. The total load on the tripod was in excess of 75lbs yet it operated perfectly and was very stable with no vibration. I guess there is some truth to the belief that wood tripods have less vibration than steel tripods!

Observers were shocked at the detail and contrast visible on the surface of the moon. Happily our guests spent quite a long time outside looking at the Moon, observing Mars, splitting Castor and its companion, cruising the area around Auriga glimpsing M36, M37 & M38. It was nice, people got bored but my friend Steve kept coming out to see what new thing I found. It was difficult to find things being in the city, keeping them in the eyepiece without doing a polar alignment and not having turned on the RA drive motor was entertaining also. How do Dob owners do this?



Anyway, this image was taken with the telescope tube as described above (so I don't really know what exactly to call it, Parallax/AT130?) using a Televue 24mm Panoptic eyepiece with my Pixel phone pressed up to the eyecup. The resulting single jpeg format image was processed using Adobe Lightroom. The air was extremely still as you can see in the image's very high sharpness and lack of any significant blur. A very fine night in the South Pasadena Observatory with guest observers!

Chip Louie

Judge Richard Garvey, Jr.

LAAS members know little about the man for whom Garvey Ranch Park and its observatory are named. Here's a personal but brief vignette of him, as told by our own Thomas R. Cave, Jr. (1923-2003) in his unfinished autobiography. The following excerpt was edited by Lew Chilton, your LAAS History Detective.

On a Saturday morning in the late spring of 1940, a few weeks before the end of my junior year at Long Beach Polytechnic High School, I took the Pacific Electric Red Car to Los Angeles to see Mr. Ray Drew about a summer job. His shop was located on West 7th Street, near Figueroa Street and Wilshire Boulevard. He had helped me five or six years earlier with the final figuring of my 6-inch mirror. He was a tall, likeable, middle-aged man with a lame foot and a blinded right eye and had been an artist in a former life.



I asked Mr. Drew if I could work for him as soon as school was out for the summer. He thought for a moment, then said that since he had a backlog of mirrors to finish for customers, he could use me a couple of days a week.

He was an excellent teacher and under his guidance I ground and polished many mirrors that summer, including my own 10-inch. Its final focal length was 112½-inches. Mr. Drew said that its figure was as good or even a little better than my 1935 6-inch mirror.

Judge Richard Garvey, Jr. was a frequent visitor to Mr. Drew's shop. Although his judge title may have only been an honorific, he had nevertheless been a practicing Los Angeles attorney for many years. Born in Santa Monica, he was the son of Irish immigrant and early Southern California pioneer Richard Garvey, Sr., who left large tracts of San Gabriel Valley land to his son that were acquired during the Civil War by the elder Garvey and were once part of Rancho Potrero Grande de Felipe Lugo.

Judge Garvey was a truly ardent amateur astronomer. After seeing me at the shop a few times, he seemed to take a liking to me. He was in his mid-50s and had been retired for some years. He was a very dapper dresser, wore spats on his shoes and drove a shiny new Cadillac. I called him Mr. Esquire.



One day, soon after I finished my 10-inch mirror, Judge Garvey asked if I would like to see some of his telescopes. Mr. Drew encouraged me to go and said, "Go on, we're not busy." Judge Garvey took me to his huge home at 2302 W. 9th Street, only a few miles from Drew's shop. He showed me his slide-off roof observatory and twin 12½-inch reflecting telescopes on a shared mount. One instrument was a Cassegrain and the other was an f/6 Newtonian. The optics and mechanicals, including the clock drive, setting circles and electric slow motions, were by the firm J.W. Fecker of Pittsburgh, Pennsylvania.

Continued on next page

A lifelong bachelor, Judge Garvey employed two full-time servants. One was a gardener and handyman, the other a woman in her fifties who was his housekeeper and cook. They both lived on the premises in apartments over a large garage.

The judge had a very complete workshop equipped with the most expensive woodworking and machine shop tools. In another portion of the garage was a storeroom for smaller telescopes. These included a Carl Zeiss Jena 5-inch binocular telescope and two smaller Zeiss telescopes.

Then he rolled out a 4¼-inch Zeiss refractor on a pyramid stand into his spacious backyard, and, using a Herschel wedge and filter, we observed the sun with powers from 50X to 150X. I never had a better view of the sun than that afternoon when we saw very fine sunspot detail.

At 4 p.m. we had tea and some fine bake goods. He asked what eyepieces I had and said that he had so many Zeiss orthoscopic oculars and duplicates that I could choose a couple for myself as gifts. I decided on a 5mm Zeiss monocular and a 7mm orthoscopic, which on my 10-inch, when it was finished, would provide magnifications of 570X and 405X. These eyepieces proved far superior to my four Ramsdens and were a tremendous improvement on the Moon and planets.

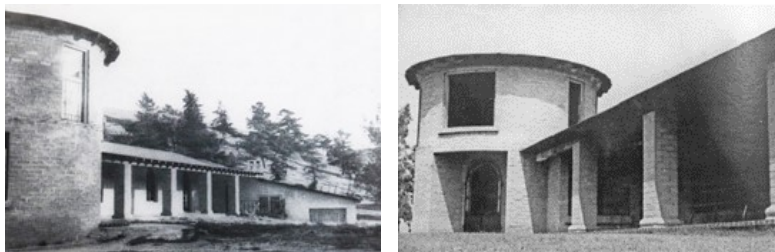
Realizing that it was getting late and that I had to take the Pacific Electric back to Long Beach, he hurriedly drove me to the Red Line station. On the way there, he told me about a small, elite astronomy club that he had organized called the Garvey Associates. Among its ten or twelve members was Mr. Lyle Abbott, the science editor of the *Los Angeles Herald-Express*. I was invited to one of their monthly meetings the following week at his home, the same day I was scheduled to work for Mr. Drew.

The judge said he would pick me up after work at 5 p.m. and I'd be his guest for dinner at his favorite Beverly Hills restaurant, and afterwards we would go to the meeting. But first, he said, I would have to get my parents' permission. They agreed that I could go.

By the time Judge Garvey picked me up, I had changed into my dress clothes. Off we went to Romanoff's, probably the most expensive restaurant in all of Los Angeles. He suggested *Escalopes of Cream Veal Parisian*. This was the first time I had eaten *haute cuisine*.

Afterwards, we went to Mr. Abbott's home and spent a great deal of time observing with his new 6-inch f/12 reflector, which was equipped with all the accessories. He told me about his years after college when he worked as a junior staff member at Lowell Observatory.

This concludes Tom Cave's recollection of Judge Garvey who, eight years later, was killed in a traffic accident on a Mexican highway near Tijuana and never got to occupy his nearly completed ranch house-observatory. Leaving no heirs, the building and 5,000 acres comprising Garvey Ranch were sold to the Metropolitan Water District. In 1952, the MWD donated 6½ acres of it and the ranch house to the city of Monterey Park for a park and recreation center. The city leased an additional 8½-acres for a picnic area. And thus ends one chapter of the Garvey Ranch story and the beginning of another. To be continued...



The Garvey Ranch house, c. 1948.

Images at left and the one of Richard Garvey, Jr., above, courtesy of the Monterey Park Historical Society.

Outreach Reports- Submitted by Van Webster

Aldama Elementary School

Date: Friday, February 24, 2017

Time: 5:00pm – 8:00pm

A small team of Los Angeles Astronomical Society Outreach members traveled to the Eagle Rock area of Los Angeles to participate in the Aldama Elementary School “Starry Nights” science evening. The wind had been blowing for most of the day and by the time the astronomers arrived at the hillside campus, the air was crisp and clear.



The school facility is one of the older Los Angeles Unified School District campuses. It is small multi story and built into one side of a narrow valley with houses and apartments perched on the facing hill, seeming to be stuck like toys on a sandbox mountain. This area of Eagle Rock is near to the Occidental College campus and is enjoying a renaissance as hipsters and young families discover the compact neighborhoods with cottage like houses and a vibrant night life on York Blvd.

As we set up, Venus was our first target, high enough above the surrounding hills to make for easy viewing. The planet is moving closer to us and a distinct crescent shape was clearly visible. As the sky darkened, Mars could be seen with the naked eye. Through a telescope, Mars and Uranus could be seen in a single view. Later, the Pleiades and M-42 became visible.

The crowd of about 125 students, faculty, families and friends provided a steady but not overwhelming presence at the telescopes. The student body is very diverse and the pupils were full of questions as they moved from instrument to instrument. The parents were particularly engaged in viewing objects and asking questions about the views and the telescopes that made the views possible.



As the night progressed, a slight wind and falling temperatures made for a very cold night. We bundled up as we could to stay warm for the last few visitors.

The school staff brought us a cold pizza as a snack while we packed up our gear and headed out into the city after a successful outreach event.

The school staff brought us a cold pizza as a snack while we packed up our gear and headed out into the city after a successful outreach event.



Apperson Street Elementary

Thursday, March 16, 2017

Thursday night, March 16, 2017, the Los Angeles Astronomical Society had two school outreach events scheduled for the same evening. Some of the society's members traveled to Granada Hills to set up telescopes for the Knollwood Preparatory Academy and other of us were in Sunland at the Apperson Street Elementary School. There's a personal connection with the Apperson Street School as LAAS Treasurer, John O'Bryan's daughter-in-law is a teacher at the school.

The event on our calendar was scheduled for 5:00 to 8:00 PM for solar viewing and then a brief look at the night sky. It turned out the school's "Family Fun Night" ran from 6:00 to 8:00 so we were set up for solar viewing with a few students on the playground until the family event started.

Two Ha scopes and one scope with a white light filter gave views of a very quiet Sun. No sun spots were seen and just a few tiny prominences visible on the Ha scopes. The sun was setting quickly and soon we were offering views of the Sun with Trees.

During the transition time between sunset and nighttime, John brought sandwiches and drinks for the astronomers to refresh themselves before the evening viewing session.

The first object sighted was Sirius followed quickly by the thin crescent shape of Venus as it is about to duck behind the Earth and pop out on the other side of the Earth/Sun relationship as a morning object. It took some discussion with the students and parents to explain how the phases of Venus are observed from our place in space.

There were three very bright lights on the east side of the playground that made viewing tough for the astronomers and families alike. To the south, the sky was pretty dark and M42 made for a tempting target. Mars and Uranus were also visible in the west.

The time passed quickly as the students and parents took their turns at the eyepieces. And then the event was over. We packed up our gear and headed off into the night.



Apperson Street Elementary

PTA[®]

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See additional photos on following page.



Team Outreach

Astronomy sparks interest in science!



Contact: Outreach@LAAS.org

A Guide To the Night Sky for April, 2017

By Tre Gibbs



Spring has arrived, making it a great time to gaze at the celestial show going on above our heads every night (weather permitting!). The days are longer and many of us are remaining outdoors later and later, hopefully enjoying the romance of twilight. One planet in particular, rarely escapes this transitional luminance and that planet is Mercury.

The swift and mysterious Mercury is the closest planet to The Sun and therefore never strays too far from it. It will only be visible for a very short window of time early this month...but you'll need a clear, unobstructed view of the western horizon to see it. On the evening of the 1st, look low and to the west about 15 - 20 minutes after sunset. As the sky dims, Mercury will begin to appear as a faint but steady "star", barely visible in the glow of twilight. The crescent moon, super faint Mars and Mercury will all appear in a straight line that night, heading towards the sun, so use them to help you find Mercury - if you need to. On the following nights, the moon will drift further east and Mercury will continue to sink even closer to the horizon, making it more and more difficult to spot each subsequent night as it heads towards the sun.

The mighty planet Jupiter, the largest in our Solar System, is wandering into our early evening skies this month. During the early part of April, Jupiter rises in the east around the same time the sun sets in the west. So look low in the east just after dark and you should easily see Jupiter - it's bright, in fact it's the fourth brightest object in the sky after the Sun, Moon and Venus. On the evening of April 10th, look to the east after sunset and you will see the "Full Pink Moon" and Jupiter rise together, with Jupiter just slightly above and to the right of the moon.

The planet Saturn rises in the east much later - around 2:00 am early in the month and around midnight late in the month. Although by mid summer, the quintessential ringed gas giant will be high in the south and poised for viewing just after sunset. But remember - it's so far away that it only appears to us as an insignificant "star". Yet a glance in even a small powered telescope or pair of binoculars would reveal so much more...

The planet Mars is scarcely visible, very low in the west after sunset only for an hour or two, Earth's orbit is faster than Mars' and as we keep speeding away from The God of War, it appears to get dimmer and dimmer, while simultaneously getting engulfed by evening twilight's glow.

Uranus and Neptune are too far away to see with the unaided eye, so that leaves the planet Venus. Where **IS** Venus? If you remember, The Goddess of Beauty and Love was exceptionally prominent in the western sky after sunset all through January and February. Now, however, due to her continuing orbit around our nearest star -The Sun, Venus rises low in the east just prior to sunrise. If you're an early riser, you may spot Venus low in the east around 5:45 am early in the month, and as early as 5:00 am late in the month.

AND... as always, use the moon to help you find the planets! On April 10th, the moon rises with Jupiter - just below and slightly to the left. On April 16th at 1:30 am, the moon and Saturn rise together, with small Saturn trailing just below the waning gibbous moon. On the morning of April 23rd, both Venus and the moon travel the sky together, both low on the eastern horizon around 5:45 am.

So until next month, KEEP LOOKING UP !

Meet
Our
New
Members



Janis and Edwin Isaman

The Thompson Family

Elana Scherr and Tom Yaegar

Alan Christopherson

David Friedman

Catherine Taber

The Karunanayake Family

Ryan Nelson and Amy Skerkoski

Amjad Askary

Devin Schoen

Javid Ghandari and Alejandro Cadavid

Marcos Perez



Remember to renew your membership once you receive notice from the Club Secretary. Use this link to learn how to renew your membership: <https://fs30.formsite.com/LAAS/MemberRenewal/index.html>

SUBSCRIBE

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

Los Angeles Astronomical Society

C/O Griffith Observatory

2800 East Observatory. Road

Los Angeles, 90027

ATTN: Treasurer

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

Eclipse Resources and Links



Image Credit: [Oregon State University - Solar eclipse, CC BY-SA 2.0.](#)

NASA's Eclipse Web Site and Resources

<https://eclipse2017.nasa.gov/>

An Observer's Guide To Viewing The Eclipse All-American Total Solar Eclipse

A free PDF booklet about the 2017 eclipse and how to observe it safely

<http://www.nsta.org/publications/press/extras/files/solarscience/SolarScienceInsert.pdf>

A resource guide to eclipses and eclipse 2017

Available to all at the Astronomical Society of the Pacific website

<http://www.astrosociety.org/eclipse>

Getting a Feel for Eclipses

A tactile guide to eclipses that illustrates the interaction and alignment of the sun with the Moon and Earth

<http://lunarscience.arc.nasa.gov/books/>

Night Sky Network

Eclipse presentations, outreach activities, and more

<http://bit.ly/NSNEclipse>

Fred Espanek Lecture at NEAF, 2016 <http://www.prairieastronomyclub.org/the-great-american-eclipse-of-2017/>

**Check your email for upcoming
announcements from the
Eclipse Committee!**

Discovering Planet Families

Universe
Discovery Guide
For April



The Sun's Family (not to scale). Credit: NASA

Discover the universe with your family and friends!

IN THIS GUIDE:

DISCOVERING PLANET FAMILIES » SKY FEATURE: POLLUX » TRY THIS! » ACTIVITY: HOW DO WE FIND PLANETS AROUND OTHER STARS? » CONNECT TO NASA SCIENCE

Download the March guide using the following link:

<https://nightsky.jpl.nasa.gov/docs/04UDGPollux.pdf>

Always use [Adobe Acrobat Reader](#) to view the Guides on a comput-

NASA'S NIGHT SKY NETWORK - FREE WEBINARS

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

April 19, 2017 (Wednesday)

9:00 PM Eastern/ 6:00 PM Pacific

Earth Science and Remote Sensing from the ISS with staff from the Earth Observing Lab at NASA Johnson Space Center

More information coming soon.

To view past webinars, please follow this link:

<https://www.youtube.com/playlist?list=PLjLQn63Cw1AJ20U3iMY3dFaDga7Cn6G8R>

Almanac



- **April 1 - Mercury at Greatest Eastern Elongation.** The planet Mercury reaches greatest eastern elongation of 19 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.
- **April 7 - Jupiter at Opposition.** The giant planet will be at its closest approach to Earth and its face will be fully illuminated by the Sun. It will be brighter than any other time of the year and will be visible all night long. This is the best time to view and photograph Jupiter and its moons. A medium-sized telescope should be able to show you some of the details in Jupiter's cloud bands. A good pair of binoculars should allow you to see Jupiter's four largest moons, appearing as bright dots on either side of the planet.
- **April 11 - 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 06:08 UTC. This full moon was known by early Native American tribes as the Full Pink Moon because it marked the appearance of the moss pink, or wild ground phlox, which is one of the first spring flowers. This moon has also been known as the Sprouting Grass Moon, the Growing Moon, and the Egg Moon. Many coastal tribes called it the Full Fish Moon because this was the time that the shad swam upstream to spawn.

Join your fellow club members by becoming an Outreach Volunteer. It's a fun and very rewarding experience for all club members. For more information, contact Heven Renteria at

Outreach@laas.org

- **April 22, 23 - Lyrids Meteor Shower.** The Lyrids is an average shower, usually producing about 20 meteors per hour at its peak. It is produced by dust particles left behind by comet C/1861 G1 Thatcher, which was discovered in 1861. The shower runs annually from April 16-25. It peaks this year on the night of the night of the 22nd and morning of the 23rd. These meteors can sometimes produce bright dust trails that last for several seconds. The crescent moon should not be too much of a problem this year. Skies should still be dark enough for a good show. Best viewing will be from a dark location after midnight. Meteors will radiate from the constellation Lyra, but can appear anywhere in the sky.
- **April 26 - 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 12:17 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.

Source: <http://www.seasky.org/astronomy/astronomy-calendar-2017.html>

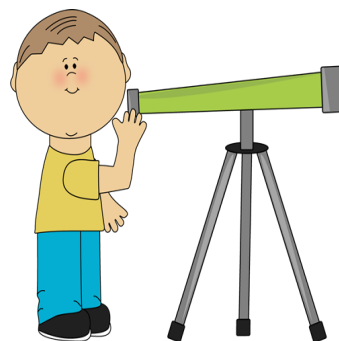
NASA Megamovie Information

Observations from the ground including high altitude observatories coupled with advanced image processing and stabilizing techniques can yield a wealth of information about the cosmos. For the 2017 eclipse a number of observing programs are being developed to explore the sun and corona through imaging and spectroscopy.

Ground-Based Operations: <https://eclipse2017.nasa.gov/ground-based-observations>

Need Help With A New Telescope?

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





Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
26	27	28	29	30	31	1 2:00 PM Star Party Sunset: 7:15 PM
2	3 	4	5 7:00 PM Garvey 8:00 PM Board Meeting	6 Outreach - Inglewood (Private)	7	8 Sunset: 7:21 PM
9 7:30 PM General Meeting	10	11 	12 7:00 PM Garvey	13	14	15 Sunset: 7:27 PM
16	17	18	19 7:00 PM Garvey 	20	21	22 Dark Sky Night (Private) Sunset: 7:32 PM
23	24	25	26 7:00 PM Garvey 	27	28 Outreach - Lynwood (Private)	29 Sunset: 7:37 PM
30	1	2	3	4	5	6

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

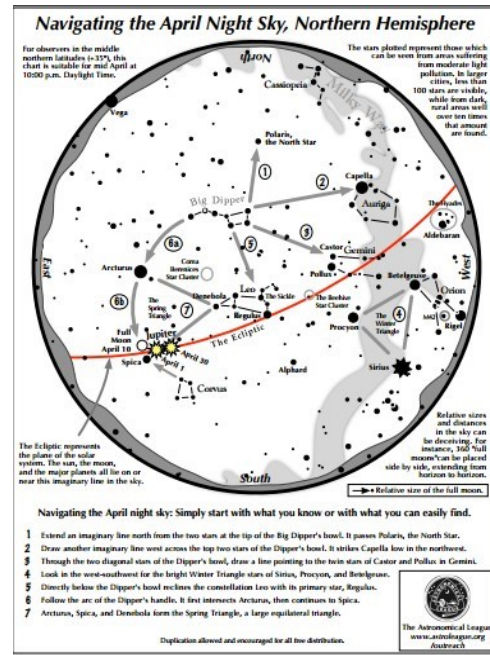
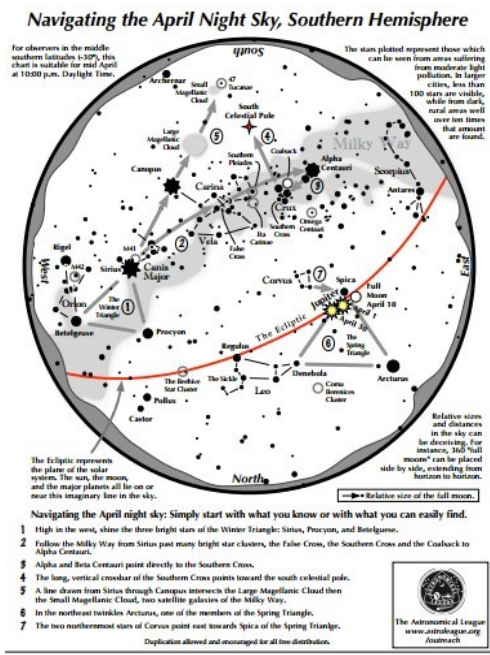
Be advised all scheduled events may not be visible on the calendar above.

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

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

April Star Maps

Click on the map of your choice to view the pdf file.



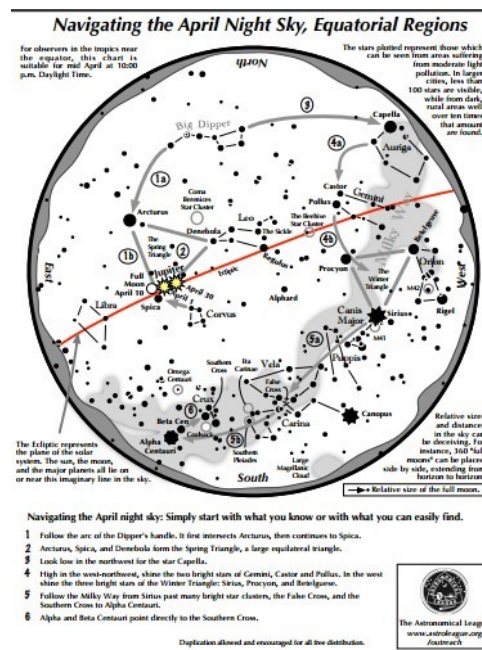
These maps originate from the Astronomical League

AL Official Website: <https://www.astronleague.org/>



Big thanks to Astronomers Without Borders for sharing the maps on their site. You can view them by clicking on the link below:

<http://astronomerswithoutborders.org/gam2017-resources/april-sky-maps.html>



Club Contact Information

President: Geovanni Somoza

geovanni_somoza@hotmail.com

Vice President: Tim Thompson

timthompson3@verizon.net

Treasurer: John O'Bryan, Jr.

Treasurer@laas.org

Secretary: Spencer Soohoo

Secretary@laas.org

Outreach Coordinator: Heven Renteria

outreach@laas.org

Webmaster: Steve Dashiell

Webmaster@laas.org

Club Communications: Andee Sherwood

Communications@laas.org

Mt. Wilson Coordinator: Darrell Dooley

mtwilsoncoordinator@laas.org

Loaner Program: Dave Sovereign

626-794-0646

Bulletin Editor: Andee Sherwood

communications@laas.org



Club Contacts

Club Phone Numbers

LAAS Message Phone:

213- 673-7355 - Checked daily

Griffith Observatory:

213-473-0800

Sky Report:

213-473-0880

Lockwood Site:

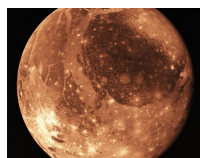
661-245-2106

Not answered, arrange time with caller.

Outgoing calls – collect or calling card



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





Contact Us
The Los Angeles
Astronomical Society
 2800 E. Observatory Road
 Los Angeles, CA 90027
 Call us for more information
 about our organization and
 outreach program.
 213-673-7355
 Visit our web site at
 www.LAAS.org

From:
 The Los Angeles Astronomical Society (LAAS)
 c/o Griffith Observatory
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To: