



Newsletter of the Pomona Valley Amateur Astronomers

Education is not filling buckets; It is lighting fires.
W.B. Yeats



Volume 41 Number 03

nightwatch

March 2021

President's Message

It's an exciting spring for people watching the development of rocket technology here on Earth, and the continued success of NASA missions across the Solar System.

On March 14, SpaceX launched its 21st batch of operational Starlink satellites. When the Falcon 9 booster, B1051, landed safely on a drone ship, it was the first time in history that an orbital rocket booster had been flown and landed nine times. That is a crucial step toward SpaceX's goal of flying each Falcon 9 at least ten times.

On March 18, NASA's Space Launch System conducted its first successful eight-minute Green Run test. The first, unmanned flight of the SLS is scheduled for this November, but might slip into 2022.

At Jupiter, NASA's Juno probe has been approved for an extended mission to run through 2025. The extended mission will include flybys of several of the Galilean moons of Jupiter, which will help NASA plan future missions to those strange and varied mini-worlds.

NASA's newest Mars rover, Perseverance, is getting its shakedown cruise after landing in Jezero Crater on February 18. Amazingly, Perseverance has already been on the Red Planet for over a month. Coming up next month will be the attempted first flight of Ingenuity, the tiny helicopter carried by Perseverance. If it's successful, it will be the first powered flight of a human-built machine on another planet.

In club news, we are coming up on elections, so if anyone wants to throw their hat in the ring for a club officer or board member position, we would love to have you. In particular, our hardworking club Secretary, Ken Elchert, is stepping down. Ken has done a lot behind the scenes to move the club forward over the past few years, and while we don't expect anyone to fill his shoes, we will need someone to fill his chair.

Elections mean that dues are due soon. In the past we've had more of a dues "season" than a deadline, but it would be nice to get them in on time this year. Rates are the same as they have been for a while, \$30 for individuals and \$40 for families.

On a more fun note, we are going to attempt another get-together at Cahuila Park, on Saturday, April 17, at 6:30 PM. We will hope for clear skies and a good look at the first-quarter moon, and maybe a peek at the winter constellations before they set. We'll be masked-up and socially-distanced, just as we were for our "park parties" last fall. Bring swap meet items or giveaways, a lawn chair, picnic dinner if you like, binoculars or scope if you want. It's a pretty easygoing affair, and we hope to see you.

I've hit a personal milestone this month: the May issue of *Sky & Telescope* is arriving in subscribers' mailboxes now, and it will be on newsstands soon, with my 60th "Binocular Highlight" column inside. That marks a full five years for me as a columnist for *Sky & Tel*. I plan to keep writing for them for as long as they'll let me, so if you have ideas for stuff you'd like to see me write about, please let me know.

Our meeting this month will be this coming Friday, March 26, at 7:30 PM, via Zoom. Our speaker will be Salem Emará from the JPL Speakers Bureau, who will update us on the Perseverance rover and its role in the continued exploration of Mars. I hope to see you all there!

Matt Wedel

General Meeting 02/26/21

PVAA president Mathew Wedel started the meeting with club notes and announcements. The members will be voting on some by-law changes during the March general meeting. We will also start collecting club dues for this year.

Our speaker for the night was Anthony Cook. He is one of the Founding Fathers of the Pomona Valley Amateur Astronomers (PVAA). His topic for the night was "Creating Griffith Observatory". Anthony worked at the Griffith Observatory from 1978 - 2021, and just recently retired.

On December 16, 1896 Griffith J. Griffith, a Welsh-born American industrialist, donated 3,015 acres to the city of Los Angeles as 'a Christmas present'. He also donated the money to build the observatory and the Greek Theater as another 'Christmas present' to Los Angeles in 1912. Griffith came from a poor family and made his money as an advisor on where to mine for gold and silver. Originally Griffith was not interested in astronomy, but upon visiting Mount Wilson, he became a big fan.

The building of the observatory began on June 20, 1933 as a Works Progress Administration (WPA) project. Griffith Observatory opened on May 14, 1935. It became the third planetarium to open in the US. More people have looked through the Griffith observatory's 12-inch Zeiss refractor than any other telescope in the world. (Over 7 million) The planetarium was used during WWII to train pilots to navigate by the stars, and for Apollo astronauts to check their celestial position. The first public television was also at Griffith Observatory. Almost all Los Angeles' fifth graders visit the observatory during the school year. (Currently through Zoom, due to the pandemic.)

While Griffith Observatory is currently closed to the public due to COVID-19 restrictions, it is getting ready to host the public soon. You can visit the observatory's website at:

<https://griffithobservatory.org/>

Gary Thompson

Club Events Calendar

Mar 26 Virtual General Meeting – Salem Emara
"Perseverance Mission"

Apr 10 Star Party – Landers GMARS
Apr 21 Board Meeting
Apr 30 General Meeting (presentation: TBD)

May 8 Star Party – TBD
May 19 Board Meeting
May 28 General Meeting (presentation: TBD)

Jun 12 Star Party – TBD
Jun 16 Board Meeting
Jun 25 General Meeting (presentation: TBD)

July 10 Star Party – TBD
July 14 Board Meeting
July 23 General Meeting (presentation: TBD)

Aug 7 Star Party – TBD
Aug 11 Board Meeting
Aug 20 General Meeting (presentation: TBD)

Sep 4 Star Party – GMARS
Sep 8 Board Meeting
Sep 17 General Meeting (presentation: TBD)

Oct 9 Star Party – TBD
Oct 13 Board Meeting
Oct 22 General Meeting (presentation: TBD)

Nov 6 Star Party – TBD
Nov 10 Board Meeting
Nov 19 General Meeting (presentation: TBD)

Dec 11 Christmas Party

PVAA Officers and Board

Officers

President	Mathew Wedel	909-767-9851
Vice President ..	Joe Hillberg	909-949-3650
Secretary	Ken Elchert	626-541-8679
Treasurer	Gary Thompson	909-935-5509
VP Facilities	Jeff Felton	909-622-6726

Board

Jim Bridgewater (2022).....	909-599-7123
Richard Wismer(2022)	
Ron Hoekwater (2021).....	909-706-7453
Jay Zacks (2021)	

Directors

Membership / Publicity....	Gary Thompson ..	909-935-5509
Outreach	Jeff Schroeder	909-758-1840
Programs	Ron Hoekwater	909-391-1943

The Little Pinwheel Galaxy

Well, we went camping to the dark site Friday, March 12, even though the forecast was poor - We just needed to get out for a change of scenery!! The forecast for Friday night did not disappoint, it rained off and on all night long as forecast. Saturday night was predicted as partly cloudy so I didn't set up for imaging. The forecast was good enough to help a friend with collimating his Ritchey-Chretien telescope and debugging his imaging system. Wouldn't you know, the skies were perfectly clear!! So, again I had to settle for imaging from home in the soup we have for a sky! The picture for this month was taken on March 16 and 18.

The target from home was NGC 3184, also known as the Little Pinwheel Galaxy. I contemplated Messier 40 which is a nice double star as it would be easy, but I wanted something to test the new set of filters I bought. NGC 3184 is similar to the M 101, the Pinwheel Galaxy, in Ursa Major, which I imaged in May of 2019. Like M 101, it is a nice, face-on spiral galaxy also in Ursa Major, close to the border with Leo Minor, about 40 million light years distant. It's a pretty good-sized galaxy spanning 7.8 x 7.2 arc-minutes of the sky and glowing at

magnitude 9.8. The bright star just to the west of the galaxy doesn't have a common name, is about 1,000 light years away, and shines at magnitude 6.6. I liked seeing the sharp spikes on the star because it means the scope is collimated, in other words, the optics are aligned. But I'm finding it difficult to get a good color balance with new filters I recently bought.

As I've mentioned before, the camera I use is monochrome so color filters are needed to produce color images. Color cameras work by having a color matrix printed directly onto the pixels so that light passing through the printed color matrix passes directly into the imaging chip. In contrast, filters used for monochrome cameras are several millimeters away from the chip and if not well made can cause light to reflect between the filter and imaging chip. You may recall some of my past images with large halos around some of the stars as a result of this type of reflection. This new set of filters is designed to greatly reduce the halos. I'll find out for sure when I shoot in H-alpha again since that filter tends to show the most egregious reflections but so far, the new filters look promising.



The image of NGC 3184 is made using the new broadband Luminance (L), Red (R), Green (G), Blue (B) filters, but for some reason, the R frames are not as bright as the other two. This is why balancing the color is difficult. As a result, the galaxy is somewhat purplish! I took 64 frames of 90 seconds through the L filter and 32 frames of 180 seconds through the RGB filters for a total of 6.4 hours. All frames were binned 2x2, but the L frame was drizzled 2x during stacking effectively making it a 1x1 binning. All frames were calibrated with 10 dark frames, 20 flat frames, and 20 flat dark frames. As usual, I

used Photoshop to process the picture, but I did not use the starless technique this time since the stars do not seem to detract from the galaxy. Also, the image is cropped to reduce the glare from a magnitude 3 star (Tania Australis, Mu Ursae Majoris) outside of the frame to the left.

While I'm not terribly pleased with how picture looks, it's what I have for now. I may still work on it and if I do improve it significantly, I'll send out the upgrade. Otherwise, I'm hoping for good weather next month at the dark site!

Ron Ugolick

ISS Photography

ISS transit of the moon using an Olympus E-MX1 camera with 300 mm Lens.

Ron Hoekwater



Bob Akers, Ron Hoekwater, and I went out to Landers to view a transit of the ISS across the Moon. Transits are pretty common; the trick is to find one that is geographically convenient and occurs at a convenient time. This one had been predicted a month or so out as occurring in the Landers area. At first it was going to be about 5 miles from GMARS, to the east, but then they boosted the orbit (due to atmospheric drag, they have to lift the orbit every now and then) and the centerline moved 12 miles more east, almost to Twentynine Palms. A week before the event they adjusted the orbit again and the transit centerline moved west, to a point between Lucerne Valley and Landers, and that's where it stayed.

Bob and I got there in the early afternoon and spent some time messing with binoculars that needed collimation. Ron rolled in a bit later and we enjoyed the cool and pleasant afternoon in the desert. We congregated around Ron's pad.

At about 4:30 we travelled the 20 minutes or so to the centerline out west on 247 towards Lucerne. We found a place on Big Horn Rd just south of 247, where the transit finder website showed to be near the centerline. I set up at 6-inch refractor and got the tracking mount approximately set. Bob got out his 7x50 binos to view that way, and Ron grabbed his huge DSLR (a jillion megapixels) with, I think, a 300 mm lens.



Ludd either napping or setting up an ISS shot.

Because the Moon was near the zenith, and my camera was straight-through, I found it best to lie on the ground and keep the Moon centered with the Autostar smart paddle. This was comfortable enough for the last 15 minutes before the 18:25:35 event. At about 18:25:10 I started recording a video with 1/4000 second individual exposures. This time, unlike when I recorded a transit in January, I had the wits to count down to the predicted event time. I could hear Bob say he had seen it--that it looked like a small bird, and I think I heard Ron say that he had seen it as well.



Ron got a picture on his camera which came out very well after post-processing. I was able to trim the good four seconds of video once I got home, and pull out one frame image. I attach both of these files, as well as a picture Ron took of my astronomy posture.

Ludd Trozpek

NASA Night Sky Notes

April 2021

**This article is distributed by NASA Night Sky Network**

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

Watch the Lion: Celestial Wonders in Leo

David Prosper

Leo is a prominent sight for stargazers in April. Its famous sickle, punctuated by the bright star Regulus, draws many a beginning stargazer's eyes, inviting deeper looks into some of Leo's celestial delights, including a great double star and a famous galactic trio.

Leo's distinctive forward sickle, or "reverse question mark," is easy to spot as it climbs the skies in the southeast after sunset. If you are having a difficult time spotting the sickle, look for bright Sirius and Procyon - featured in last month's article - and complete a triangle by drawing two lines to the east, joining at the bright star Regulus, the "period" in the reverse question mark. Trailing them is a trio of bright stars forming an isosceles triangle, the brightest star in that formation named Denebola. Connecting these two patterns together forms the constellation of Leo the Lion, with the forward-facing sickle being the lion's head and mane, and the rear triangle its hindquarters. Can you see this mighty feline? It might help to imagine Leo proudly sitting up and staring straight ahead, like a celestial Sphinx.

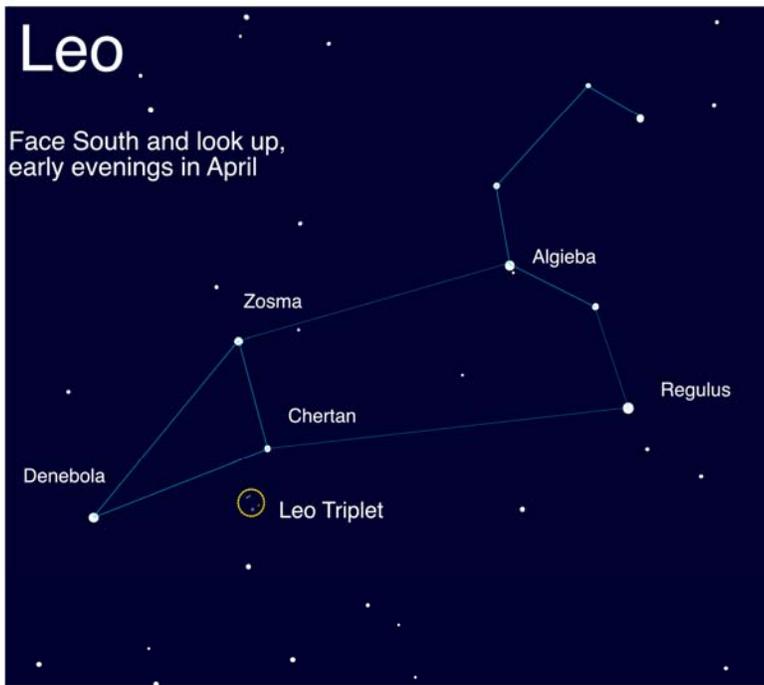
If you peer deeper into Leo with a small telescope or binoculars, you'll find a notable double star! Look in the sickle of Leo for its second-brightest star, Algieba - also called Gamma Leonis. This star splits into two bright yellow stars with even a small magnification - you can make this "split" with binoculars, but it's more apparent with a telescope. Compare the color and intensity of these two stars - do you notice any differences? There are other multiple star systems in Leo - spend a few minutes scanning with your instrument of choice, and see what you discover.

One of the most famous sights in Leo is the "Leo Triplet": three galaxies that appear to be close together. They are indeed gravitationally bound to one another, around 30 million light years away! You'll need a telescope to spot them, and use an eyepiece with a wide field of view to see all three galaxies at once! Look below the star Chertan to find these galaxies. Compare and contrast the appearance of each galaxy - while they are all spiral galaxies, each one is tilted at different angles to our point of view! Do they all look like spiral galaxies to you?

April is Citizen Science Month, and there are some fun Leo-related activities you can participate in! If you enjoy comparing the Triplets, the "Galaxy Zoo" project (galaxyzoo.org) could use your eyes to help classify different galaxies from sky survey data! Looking at Leo itself can even help measure light pollution: the Globe at Night project (globeatnight.org) uses Leo as their target constellation for sky quality observations from the Northern Hemisphere for their April campaign, running from April 3-12. Find and participate in many more NASA community science programs at science.nasa.gov/citizenscience. Happy observing!

NASA Night Sky Notes

April 2021



The stars of Leo: note that you may see more or less stars, depending on your sky quality. The brightness of the Leo Triplet has been exaggerated for the purposes of the illustration - you can't see them with your unaided eye.



Your view of the three galaxies in the Leo Triplet won't look as amazing as this image taken by the VLT Survey Telescope, unless you have a telescope with a mirror 8 feet or more in diameter! Still, even a small telescope will help your eyes pick up these three galaxies as "faint fuzzies": objects that seem blurry against a background of pinpoint stars. Let your eyes relax and experiment with observing these galaxies by looking slightly away from them, instead of looking directly at them; this is called averted vision, a handy technique that can help you see details in fainter, more nebulous objects.

Image Credit: ESO, INAF-VST, OmegaCAM; Acknowledgement: OmegaCen, Astro-WISE, Kapteyn I.

PVAA Bylaws changes

The PVAA Board has identified several issues with the current club Bylaws. Per Article IX of the Bylaws, the procedure for amending the Bylaws is that proposed changes will be published in the club newsletter to be read and openly discussed at two regularly-scheduled general meetings. A final vote will be held at a third regularly-scheduled general meeting. Proposed changes must pass by a vote of 2/3 of the members present.

The proposed changes are detailed below.

Article V - Officers and Members of the Board of Officers, Section 1, 1.0

Current language:

The Board of Officers of the Pomona Valley Amateur Astronomers shall consist of the following elected officers (in order of succession): President, Vice President, Secretary, Treasurer, Vice President of Facilities and Resources, Four Board Members at Large.

Proposed new language:

The Board of Officers of the Pomona Valley Amateur Astronomers shall consist of the following elected officers (in order of succession): President, Vice President, Secretary, Treasurer, and Four Board Members at Large. A Vice President of Facilities and Resources may be elected when the club has facilities and resources that would benefit from or require such oversight, and a Workshop Director may be appointed by the Board if the need arises for someone to oversee workshops in the future.

Rationale for the change:

The club does not currently have any facilities, and our shared resources are down to a handful of pieces of equipment in a few members' garages. We currently have a VP of Facilities and Resources—club member Jeff Felton—but for the last several years that person has had no facilities or resources to oversee. So it seems logical to thank Jeff for his service and dissolve the position, while leaving open the option of electing someone to the position in the future, should there be a need.

Similarly, the position of Workshop Director is currently unfilled, and since we have not given workshops in several years, it seems best to make this an ad-hoc position. Per Article VII, the Workshop Director is not elected, but appointed.

Article XI - Membership Database and Mailing List, Section 1, 1.0

Current language:

The full membership list, including names, addresses, and phone numbers, is to be made available to any member of the club on request in printed form, on gummed labels, or on computer disk. (The member requesting the information must pay any associated costs.) A mailing originating from individual members must state that it is not an official club mailing.

Proposed change:

The Board proposes to delete this article in its entirety and change the numbering of Article XII to Article XI.

Rationale for the change:

The idea of giving out the contact information of everyone in the club to any member that asks is out of

step with modern privacy concerns. The problem of getting information out to club members has been largely solved by the advent of email and the internet. If any member needs to get information out to the entire club, they can post it to the club Facebook page, or send it to the Board to be distributed to the membership pending the Board's approval.

Article XII - Incorporation and Tax-Exempt Status, Section 3, 1.0 - Ongoing Reporting Requirements

Current description:

(This section lists the state and federal entities to which the club must report regularly to maintain its status as a tax-exempt 501(c)(3) nonprofit public benefit corporation, and currently also lists the specific forms required and their URLs.)

Proposed new language:

For the Pomona Valley Amateur Astronomers to maintain its federal and state tax-exempt status and operate as a 501(c)(3) nonprofit public benefit corporation in the state of California, regular (annual or biennial) reporting is required to the US Internal Revenue Service, California Franchise Tax Board, California Secretary of State, and California Attorney General's Registry of Charitable Trusts. The specific forms, their annual due dates, and the websites where they may be found will be kept in a separate document, which will be assigned to a PVAA officer to keep up-to-date.

Rationale for the change:

The problem with listing the specific forms and their URLs in the Bylaws is that although the forms are easy to find online, the specific URLs often change from year to year as various government entities overhaul their websites, and occasionally the names of the forms change as well. Listing the precise forms required in any given year as well as their URLs means that the Bylaws will regularly become out of date and require revision. For these reasons, the board unanimously approved Claire Stover's recommendations that

1. a separate document be created to list the current URL for each document that is required to be filed by the PVAA as a non-profit organization
2. this document be assigned to a PVAA officer to keep up-to-date
3. this document be referenced in Article XII of the by-laws

All Articles

The board unanimously approves correcting all the typographical errors in the Bylaws. The club secretary, Ken Elchert, has compiled a list.