



Newsletter of the Pomona Valley Amateur Astronomers

And if you gaze for long into an abyss,
the abyss gazes also into you.
Friedrich Nietzsche



Volume 41 Number 05

nightwatch

May 2021

Ron Ugolick's Astrophotography

As mentioned last month, May was a “two-fer”. New moon was Tuesday, May 11, so both weekends were equally spaced for imaging. The nights of May 7 and 8 were OK, but not great, with some very thin high clouds, but I had trouble aligning my mount the first night and fog rolled in around 2:00, so May 7 was a short night. May 14 was a nice night, but I discovered my mount was not working properly. Stars kept drifting and I couldn't resolve the problem, consequently May 15 was a non-starter, although it was also completely cloudy. Nevertheless, I like how the image came out, even though it's with less than half the data I wanted. Hopefully by next month I will have solved the mount problem and have good weather.

The primary target for the two weekends was an easy one, given the last several images were more difficult ones. Interacting galaxies NGC5194 and NGC5195, which I thought were collectively M51, the Whirlpool Galaxy, but it turns out only NGC5194 is the Whirlpool, while NGC5195 is its companion galaxy. But together they are indeed known as M51. The Whirlpool galaxy is a so-called grand design galaxy, where the spiral arms are well-defined, with an active nucleus, meaning the center is more luminous than expected from just stars. Instead, the excess luminosity is believed to be from mass accreting into a massive black hole at the center of the galaxy.



Astrophotography continued

M51 is located near the end of the handle of the Big Dipper in the constellation Canes Venatici. At about 25 to 31 million light years away, it can be seen easily with binoculars although it is not naked eye visible. The Whirlpool shines at magnitude 8.5 while NGC5195 glows only at magnitude 10.5. The Whirlpool is nearly half the size of the Milky Way, spanning about 76 thousand light years across. Overall, M51 spans an area of the sky about 11 x 7 arc-minutes, a little less than a third the size of

the full moon. It is believed that NGC5195 passed through the Whirlpool at least twice, first around 500 to 600 million years ago and then again 50 to 100 million years ago. There seems to be some confusion as to which galaxy is closer to us, though. Distance measures place the Whirlpool further away, but evidence of a silhouette of the dust-rich tidal bridge between NGC5195 and the Whirlpool suggests that NGC5195 is the more distant galaxy.



As a bonus, while imaging M51 on the night of the 8th, I set up a tripod with a DSLR and grabbed 20 images of a common asterism, the Big Dipper, which is part of the constellation Ursa Major. No flats were needed since the lens/camera combination is free of vignetting, but I shot 20 darks for removal of hot/dead pixels since I turned off in-camera noise reduction. The images were taken at ISO 1600, f/5.6, 25mm focal length, and 5 seconds exposure time. I thought those settings would be sufficient to keep the stars round, and live view on the camera seemed to confirm they were round, but if you zoom in, you can see a little trailing of the stars. I probably needed to increase the ISO and drop the shutter to 2 seconds. It's interesting to note that the Big Dipper is actually difficult to see in the picture because of the myriad of fainter stars around it. If you haven't been to a truly dark site, the image shows what you can expect to see, namely, that the bright stars are hard to see because all of the stars are bright!

From the processing standpoint, M51 is an L-HaRGB image. I first combined the red, green, and blue sub-frames into a color image and using Photoshop, stretched the image about 80% of the way to completion. Then I added the Ha frame to that

assigning the Ha to the red channel, which results in a very red image (two doses of red!) that needs to be adjusted. By doing this, I am able to accentuate the red areas in the galaxy. Finally, the luminance frame is added to get the structural details in the Whirlpool and in the dust lanes. Then color saturation was increased and final adjustments to the brightness were done.

The image is created from a total of 36 luminance, 9 hydrogen alpha, 12 red, 10 green, and 9 blue shots. The luminance, green, and blue frames are all 300s exposures, while the Ha and red frames are 600s exposures. All were calibrated with 12 corresponding darks, 20 flats, and 20 dark flats. They were stacked using DeepSkyStacker except for the Ha frames which were stacked in Nebulosity. For some reason DSS couldn't find enough stars to register the Ha frames. FITS Liberator was used for initial stretching before combining the stacks in Photoshop as previously described.

Hopefully you enjoy the images. Just one more thing – if you want to see any of my earlier images, you can take a peek at my Astrobin gallery at <https://www.astrobin.com/users/ruccdu/>

Ron Ugolick

General Meeting 4/30/21

PVAA had another monthly general meeting using Zoom. We had announcements which included the upcoming voting for board member positions. The night was broken up into 3 different presentations.

Gary Thompson gave a presentation on SpaceX and what was new in their fast-paced development. At the time of the meeting there where 2 Crew Dragon spacecraft with 8 astronauts docked with the ISS. Crew 2 is scheduled to return this Halloween. In the meantime, Cargo Dragon (CRS-22) is scheduled to dock with the ISS.

NASA has selected SpaceX’s Starship for the Artemis HLS (Human Landing System) with a 2.89-billion-dollar award. Right now, only SpaceX was awarded the Option A round award. In the first round Blue Origin received 579 million, Dynetics received 253 million and SpaceX received 135 million. Blue Origin’s second round bid was 5.99 billion, and Dynetics’ is estimated to be 9 to 10 billion. Starship can act as a base and has 2 independent airlocks. SpaceX can land 4 or more astronauts and 100 tons of cargo on the moon.

Inspiration4 is scheduled to launch on Sept 15 of this year with 4 civilians not connected to NASA or SpaceX. It will be the first all-civilian mission to space. Since it will not dock to the ISS, it is replacing the docking adapter with a ‘viewing bubble’ for 360-degree view of out the top of the spacecraft.

Axiom-1 is scheduled to launch in January 2022 to the ISS with retired NASA astronaut Michael Lopez-Alegria, and 3 other civilians. Tom Cruise is expected to fly on a later flight.

The SpaceX-Yusaku Maezawa dearMoon project is a 6-day mission doing a figure 8 around the moon and back. This will be on the SpaceX spacecraft called Starship and will take 8 civilians and 1 or 2 crew members. The proposed launch date is 2023 but will not take place until Starship is thoroughly tested and one uncrewed circumlunar test flight. Height: 120m/394ft, Diameter: 9m/30ft Payload to LEO: 100+mt/220,000 lb., Thrust @ launch: 72MN/16Mlbf Payload volume: 1100m3/38,800ft3

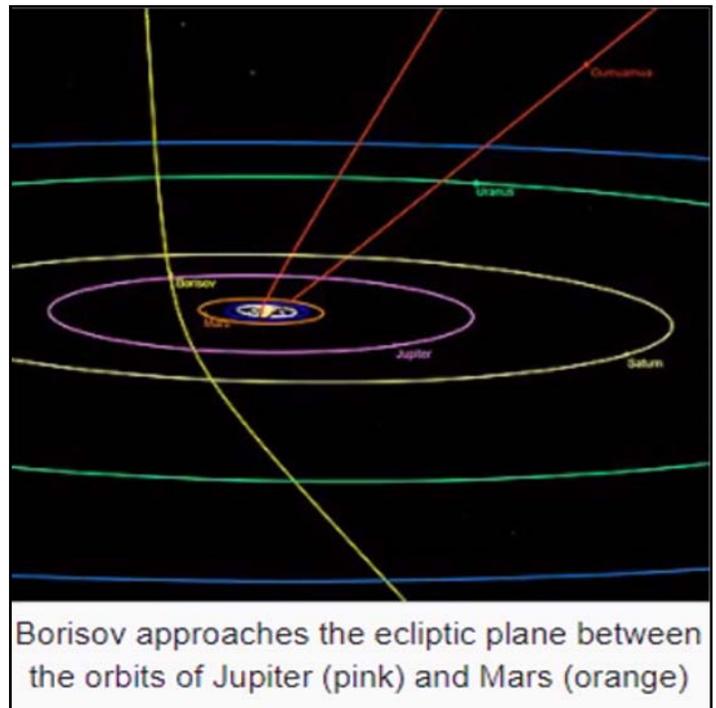
Last year SpaceX put more mass into orbit than the rest of the world combined. That was mostly due to Starlink. The US has tentatively granted SpaceX \$885.5 million to provide rural internet access. The highest speed reported so far has been 215 mbps.

Steve Sittig gave a presentation on the Comet 2I/Borisov. This is the 2nd interstellar visitor that humankind has discovered so far. It was discovered on August 30th, 2019 (8/29 local time) by Gennadily Borisov. Borisov is an amateur astronomer and telescope maker. He made the telescope he discovered it with. The 2I part of the name is: 2 being the second, and ‘I’ being ‘interstellar’. The first identified interstellar object was 1I/Oumuamua. When he saw that the movement of this new

object was slightly different than that of the main body of asteroids, he checked all his reference materials and immediately posted it on the world webpage for dangerous asteroids. On the post he wrote that the object was diffuse and that it was not an asteroid, but a comet. (This is the 8th comet Gennadily has discovered.)

The comet became active 4-5 AU from the Sun in June 2019. It was spewing 2 kg/sec of dust, 60 kg/s of water. The high amount of CO is an indication that it comes from a very cold place, either very far away or from a cold red dwarf star. In late March 2020, the Hubble Space telescope spotted a chunk about 100 meters across had broken off the 500-meter core. It was moving away from the main body at about ½ meter per second. This splinter piece eventually evaporated.

The future of interstellar studies will be greatly enhanced when the Large Synoptic Survey Telescope in Chile comes online in 2022. It will be able to survey the entire visible sky every 3 nights. The European Space Agency is working on a spacecraft concept known as the Comet Interceptor, which could visit interstellar objects as they wing their way past the Sun. A five-year notice would likely be needed for an intercept mission. With these two interstellar visitors, a new field of astronomy has emerged trying to better understand the solar and extra solar system formation and primordial conditions



Club Events Calendar

May 28 **General Meeting – Clyde Plymate**
“Big Bear Solar Observatory”
Jun 12 **Star Party – TBD**
Jun 16 **Board Meeting**
Jun 25 **General Meeting (presentation: TBD)**

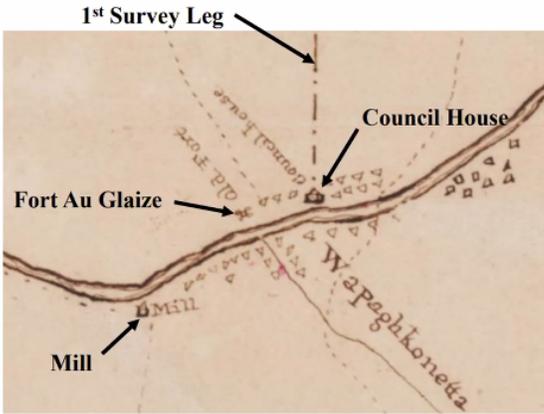
July 10 **Star Party – TBD**
July 14 **Board Meeting**
July 23 **General Meeting – Dr Thomas Spirock**
“Latest Lucky Imaging Results”

General Meeting continued

Ken Elchert gave a presentation on an essay he wrote while doing research for a historical marker (Which now, because of him, has been approved and funded.) to commemorate old Fort Au Glaize and the Shawnee Council House. These were in Neil Armstrong's and Ken's hometown of Wapakoneta, Ohio.

The Wapakoneta Shawnee Reserve was created by the signing of the Treaty of Fort Meigs on September 29, 1817. This was signed by the U.S. and seven Ohio tribes which ceded most their remaining land in Ohio to the U.S. It created the 100 square mile Wapakoneta Reserve. On September 17, 1818 20 square miles was added to the reserve and was witnessed by Neil Armstrong's great-great-great grandfather John Armstrong.

Comparison of 1819 Survey Sketch to Actual Locations of Fort Au Glaize and the Council House

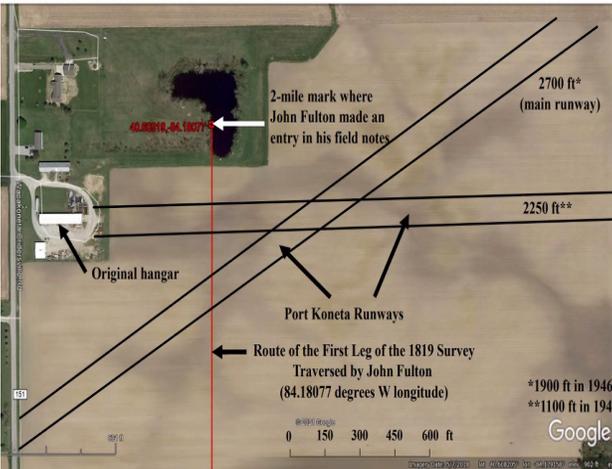


1819 Survey Sketch



2018 Google Earth

John Fulton's Route Through the Port Koneta Site



Ken also displayed a photo of the 1946 Port Koneta Flight Class with Neil Armstrong and Anna Bohrer-Swink, who later resided in Pomona and Claremont.

Neil's Birthplace on Washington Pike, Wapakoneta
Picture taken on July 20, 2019



Port Koneta Flight Class of 1946
Special Addition for PVAA



http://airfields-freeman.com/OH/Airfields_OH_NW.htm#wapakoneta

Snapshot from Google Earth of the Area Encompassed by the Wapakoneta Shawanese Reserve



General Meeting 4/30/21 continued

The final presentation of the night was from Matt Wedel about the Willamette Meteorite that was found on Oregon in 1902. Ellis Hughes, a worker of Oregon Iron and Steel Company, discovered the meteorite and slowly dragged the 15.6-ton rock from the company's land to his neighboring ranch. This took 90 days to move it ¾ mile. They then charged admission to see the meteorite and the mill owners then sued and won possession of the meteorite. The meteorite eventually ended up at New York City's American Museum of Natural History in 1906. It was originally known to the Clackamas Chinook Native American tribe a Tomanowos and is a sacred object to them. The local tribe council sued the American Museum of Natural History and an agreement was worked out that the tribes could have access and conduct a private ceremony once a year, and it would remain on display.



Matt with scale model of 15.6-ton Willamette Meteorite

Gary Thompson

Telescope for Sale

Hi, my name is John Grove, I'm a retired science teacher in La Crescenta. I have a Meade LX-200 10 in telescope that is just too much for me. My father gave it to me some years ago, and I built a large case for it that would fit in the bed of my truck, but I can't and haven't been using it. It comes with the controls of course, but I also have the tripod, solar filters, an alt-azimuth mount and maybe some eyepieces. I'm asking \$1900 for everything. I think that's fair but....

If anyone in your club or any other Southern California Club is interested, my email is 6cat.grove@gmail.com and my phone is 818-422-6348.

If you know any of the other club presidents, please pass this along to them as I would really like it to be used. Any questions about this I will try and answer as fast as I can.

PVAA Officers and Board

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NASA Night Sky Notes

June 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!

Astrophotography With Your Smartphone

David Prosper

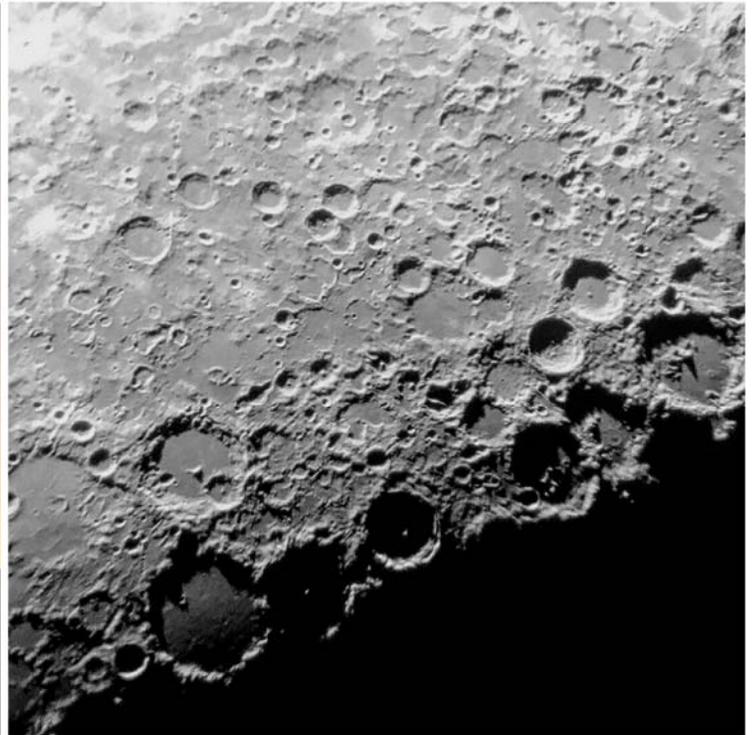
Have you ever wanted to take night time photos like you've seen online, with the Milky Way stretched across the sky, a blood-red Moon during a total eclipse, or a colorful nebula? Many astrophotos take hours of time, expensive equipment, and travel, which can intimidate beginners to astrophotography. However, anyone with a camera can take astrophotos; even if you have a just smartphone, you can do astrophotography. Seriously!

Don't expect Hubble-level images starting out! However, you can take surprisingly impressive shots by practicing several basic techniques: steadiness, locked focus, long exposure, and processing. First, steady your smartphone to keep your subjects sharp. This is especially important in low light conditions. A small tripod is ideal, but an improvised stand, like a rock or block of wood, works in a pinch. Most camera apps offer timer options to delay taking a photo by a few seconds, which reduces the vibration of your fingers when taking a shot. Next, lock your focus. Smartphones use autofocus, which is not ideal for low-light photos, especially if the camera readjusts focus mid-session. Tap the phone's screen to focus on a distant bright star or streetlight, then check for options to fine-tune and lock it. Adjusting your camera's exposure time is also essential. The longer your camera is open, the more light it gathers - essential for low-light astrophotography. Start by setting your exposure time to a few seconds. With those options set, take a test photo of your target! If your phone's camera app doesn't offer these options, you can download apps that do. While some phones offer an "astrophotography" setting, this is still rare as of 2021. Finally, process your photos using an app on your phone or computer to bring out additional detail! Post-processing is the secret of all astrophotography.

You now have your own first astrophotos! Wondering what you can do next? Practice: take lots of photos using different settings, especially before deciding on any equipment upgrades. Luckily, there are many amazing resources for budding astrophotographers. NASA has a free eBook with extensive tips for smartphone astrophotography at bit.ly/smartastrophoto, and you can also join the Smartphone Astrophotography project at bit.ly/smartphoneastroproject. Members of astronomy clubs often offer tips or even lessons on astrophotography; you can find a club near you by searching the "Clubs and Events" map on the Night Sky Network's website at nightsky.jpl.nasa.gov. May you have clear skies!



A small tripod for a smartphone. They are relatively inexpensive – the author found this at a local dollar store!



The Moon is large and bright, making it a great target for beginners. The author took both of these photos using an iPhone 6s. The crescent moon at sunset (left) was taken with a phone propped on the roof rack of a car; the closeup shot of lunar craters (right) was taken through the eyepiece of a friend's Celestron C8 telescope.
