Reflections

The Newsletter of the Popular Astronomy Club

ESTABLISHED 1936

Affiliated with

May 2021

President's Corner: April 2021

Alan Sheidler

Welcome all to the May 2021 edition of "Reflections". As I write this, I perceive a sense of optimism all around me. Perhaps you have sensed this too? At the moment, 53% of eligible Illinoisans have already received at least their first vaccination, and 31% are now fully vaccinated, which means we may soon be able to return to normal life. At the moment, Illinois is in Corona Virus Response "Phase 4", but could very soon move to "Bridge Phase," enabling the transition to a return to normal for everyone. See the chart below which I excerpted from the Illinois Coronavirus website: https://coronavirus.illinois.gov/s/bridge-phase

On another front, PAC was contacted by Chad Potter from John Deere Middle School to rehabilitate the school's 8-inch LX200 telescope. We were successful in getting the scope operational and used it at our first club observing session of the season at the Paul Castle Observatory on March 20.

The school intends to purchase additional telescopes and host observing sessions next school year. Mr. Potter has invited the Popular Astronomy Club to participate in these observing sessions and to help develop an astronomy program for the school. I would like to applaud Mr. Potter's enthusiasm and welcome the school's support for developing a program relating to the science of astronomy.

I have a feeling public interest will intensify in the coming months and that there will be additional requests for PAC's involvement. I invite PAC members to be involved in these opportunities.

I am reminded by our observatory director, Rusty Case, we need to get the PACMO mobile observatory out of winter storage and ready for this year's public observing sessions. If you would like to be trained as a telescope operator, please let Rusty or I know and we will provide training. The PACMO's 12" LX200 is a large telescope with formidable capabilities. We also have an astronomical video camera and flat screen monitor in the PACMO.

I would encourage folks to be involved and learn the use of this equipment. Not only is this a learning opportunity, it is "highly cool." In any event, we always need volunteers to assist in our public observing sessions.

In the meantime, please enjoy this month's newsletter and keep looking up!

State Of Illinois Coronavirus Response

Setting	Phase 4	Bridge Phase	Phase 5
Festivals and general admission outdoor spectator events	15 people per 1,000 sq. ft.	30 people per 1,000 sq. ft.	no capacity limit

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STEP INTO THE SPOTLIGHT

Since its founding in 1936, the Popular Astronomy Club has relied on the volunteer efforts of its members to keep the club going and help it meet its mission of sharing the wonders of the night sky both among those who join PAC and with the general public.

PAC needs you to step into the spotlight by volunteering to help out at public observing sessions and other events, giving constellation reports and other presentations at club meetings, and submitting articles, photos and other items for the "Reflections" newsletter and for the regular monthly newspaper article.

Turn to page 17 for more information on how to send something to "Reflections." You can sign up for a constellation report or other presentation by contacting Alan Sheidler or Dino Milani: adsheidler@gmail.com dinomilani@qconguard.com.

We look forward to hearing from you, and we thank all PAC members whose active participation makes this one of the best astronomy clubs in the nation!

ANNOUNCEMENTS / INFO

NCRAL Seasonal Messier Marathon Program

NCRAL's Seasonal Messier Marathon observing program is NOT designed to qualify observers for the Astronomical League's Messier Observing program; the two programs are unrelated and observing requirements are quite different. In the NCRAL program, the main requirement is to quickly observe and essentially check off items from one of four seasonal lists of Messier objects as noted in the section to follow.

NCRAL recognition will consist a suitable printed certificate and a 3⁄4-inch enameled star pin (a different color for each season). There will be no direct cost to the membership for participating in the award program; the cost of the program (pins, certificates, mailers, postage) will be borne by the Region as a benefit of affiliation. Relevant program documents are linked below

NCRAL Seasonal Messier Marathon Rules

NCRAL SPRING Seasonal Messier List

NCRAL SUMMER Seasonal Messier List

NCRAL AUTUMN Seasonal Messier List

NCRAL WINTER Seasonal Messier List

HOW'S THE WEATHER?

meteoblue
weather close to you

CLEAR OUTSIDE

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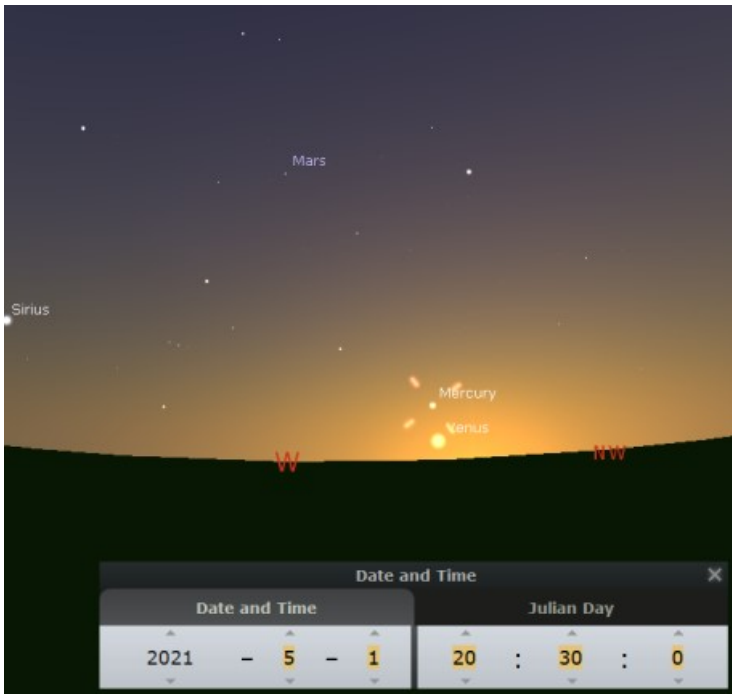
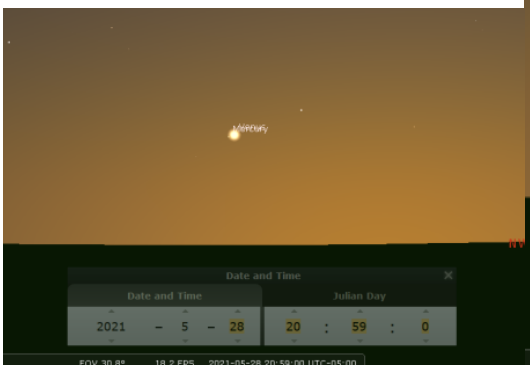
If you have questions or request, or want more information on PAC, send an e-mail to: **popularastronomy-club@gmail.com**

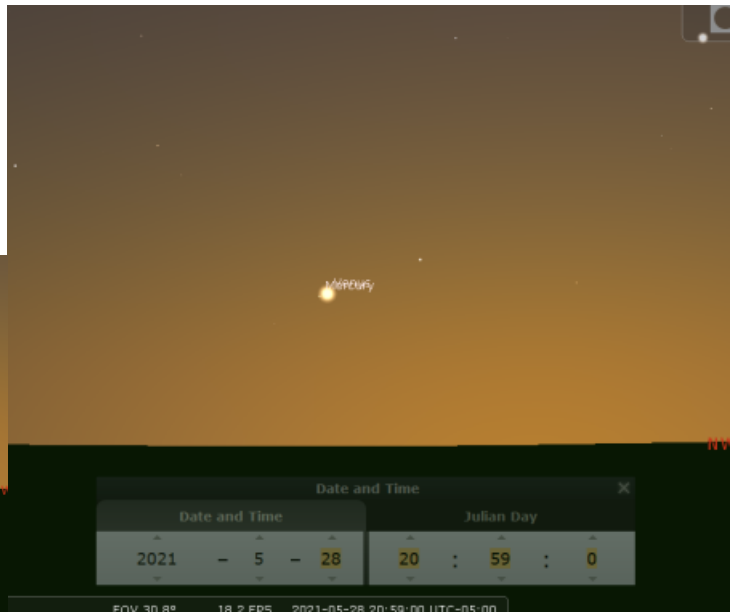
The planets in May 2021: Mercury and Venus

Mercury on the 1st can be found in the west-northwest evening sky at 8:30 pm. It is 4° 54' above Venus (magnitude: -3.88) or 7°42' above the horizon. Mercury shines at magnitude -1.06. Catch Mars above and to the left of the pair. The Pleiades are just above Mercury at 9 pm. Mercury continues to rise above the horizon until it is 13° above the horizon on the 13th. A surprising conjunction occurs on the 28th at 8:30 pm when Venus and Mercury are separated by 14'. *This is one of the best chances to catch both planets in one eyepiece field of view this year.* Mercury continues to go lower until it is lost in the twilight on the 31st.



Venus can be found on the west northwest horizon on May 1. At 8 pm Venus is 7º 49' above the horizon with Mercury above it. (It stays in the relative same position throughout May.





The planets in May 2021

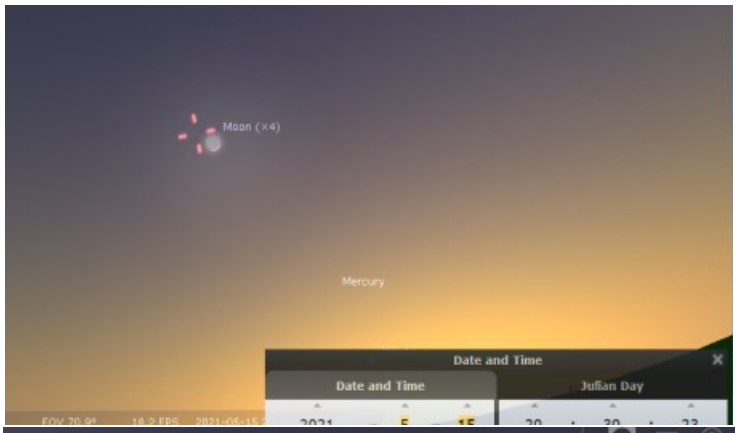
Mars, Jupiter, Saturn and Uranus

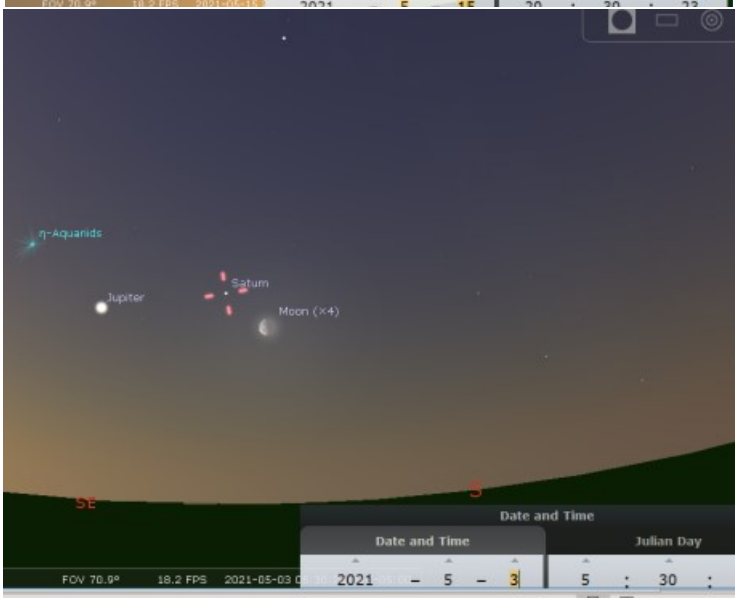
You can view **Mar**s in the western sky 42º above the horizon at 8:30 pm. It is about magnitude -1.76 and is above Mercury by 39º. The 3.8 day old Moon passes south of it on the 15th. By month's end it is about 23 º east southeast of Venus.

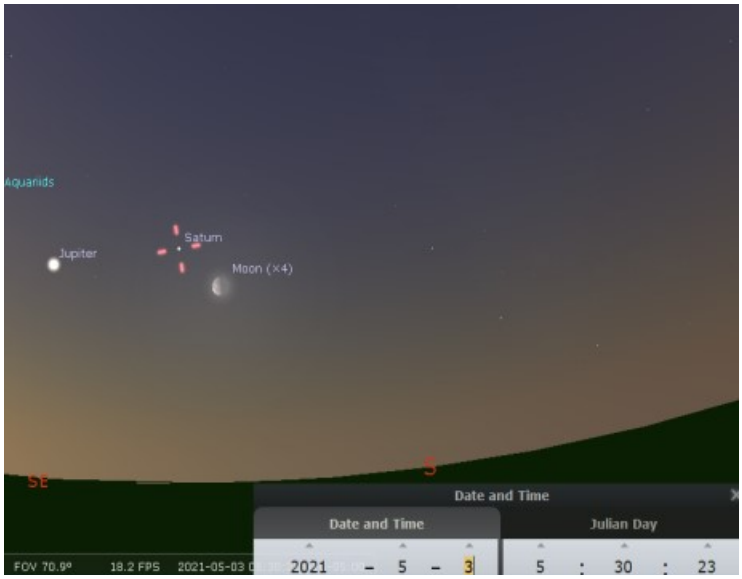
Jupiter is low in the southeast sky on May 1st at 5:30 am. It is 22º above the horizon at a brilliant magnitude of -2.22. On May 4th, the 8 day old Moon passes just south of the planet. The Moon repeats almost an exact performance on the 31st, passing just south of Jupiter again.

Saturn on May 1 is about 14 º west of Jupiter. It is about 0 magnitude and makes a nice pairing with Jupiter and the Moon nearby. On the 3rd, the Moon passes to the south, making a nice conjunction. The Moon returns to almost the exact same position on the May 31.

Uranus is too close to the Sun for viewing in May and **Neptune** is just peaking over the southeastern horizon at dawn on May 1.







ASTRO-TRIVIA QUESTION

Most Americans call it the "Big Dipper," but what name do residents of Great Britain give to this well-known asterism in Ursa Major?

A view from the sidelines: Terry Dufek

Hello, all PAC members and others!

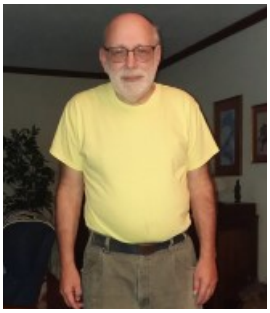
First, I want to express my thanks to all who have aided and supported my efforts to get better over the last four months. I am doing much better and, by the time you read this, I will have completed all my radiation treatments.

Special thanks to all of you who have given me rides over the past few months; it's been a real help.

I will still have my occasional trip to Iowa City, at maybe once or even twice a week to see my doctors. I did double-check, and I cannot drive anymore. The doctor said even a bike was out. However, I now have cell phone with Uber and Lyft installed.

I did one practice mapping of a trip to see how it would go but did not hit the trip switch so, if you had any advice, I would appreciate it. I am walking and can do about 4 to 6 miles, but I still get tired. I have lost a bit of weight and am down by about 25 pounds. Fortunately, I had access to a good supply of clothes to fit me now.

Terry Dufek sends thanks to all the PAC members and others who've helped him over the past few months.



I would appreciate any lifts out to Paul Castle and to other PAC events to do some observing and to otherwise participate with other club members. I really do miss it. My ability to participate may depend on how I react to my medication.

I will try to do some observing from my house as soon as the weather is better. I do have a little short-term memory loss but I found it can be minimized by some repetition. My main enjoyment now is taking care of my cat, Franklin.

Again, many thanks to everyone, and take care.

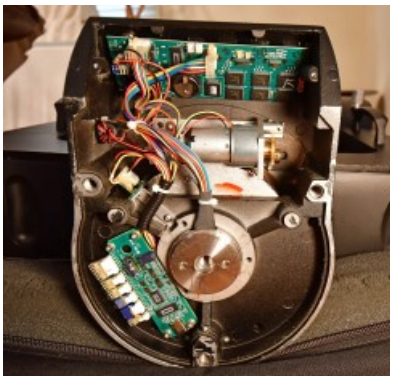
PUBLIC OBSEVING SEASON TAKES OFF AT NIABI

PAC had its first public observing session of the season (and in over a year) at Niabi Zoo on April 17. Video equipment and flat screen TVs were used to enable visitors to socially distance and enjoy incredible views of celestial objects without having to touch the equipment. Four telescopes were set up, including the PACMO. In the group photo are Al Sheidler, Wayland Bauer, Tim Holt, Ron Mullen (behind), Hugh Holt, Mary Holt (behind), Alex Holt, Dino Milani, Terry Dufek (behind), Dale Hachtel, Rusty Case (behind), and visitor Rick Dussliere. Other visitors who were not present at the time of the group photo also attended. Conditions were not ideal due to thin clouds, but objects were successfully observed; go to page 11 to see a few of the images captured that night.

PACMO telescope has a working GPS again

In 2019 (if I remember correctly) there was a system-wide software update to the world-wide GPS systems which rendered many GPS-equipped telescopes unable to acquire date and time information from the system.

Our PACMO scope was no exception, forcing us to manually input date, time, and location information.



The PACMO scope with the cover plate removed.

In order to remedy the situation, after some research we found out it is possible to flash new software into the scope's electronics which correct the GPS operation. So, in March, I pulled the cover plate off of the scope's base and removed the motherboard *(shown at the top of the photo)*, which I then sent in for reprogramming. I got this back on April 2. I also changed the 3-volt lithium battery on the mother board as well, which I found was nearly dead after 8 years of faithful service.

In any event, after a bit of careful reassembly effort, I got the updated motherboard reinstalled.

The software version now resident in the motherboard is LX200 GPS SMT Version 4.2l (small L). The original "obsolete" version was 4.2g.

We tried out the PACMO scope at our club member observing session on April 3 and verified the GPS system now is fully functional once again. This should enable quicker and easier setup and alignment of the PACMO scope as we get back into doing public observing sessions this year.

Alan Sheidler

Repairs performed on telescope electronics

On the afternoon of April 22, Dale Hachtel and Roy Gustafson met at the Sheidler home to attempt repairs on Roy's 10" LX200. Roy reported that the scope's electronics were completely unresponsive at power-up.

I had performed some basic trouble shooting and found the power cable's in-line fuze and the scope's internal fuze were both blown. I replaced these fuzes, which then allowed the scope to turn on, but the scope's computer system would not boot up and display "READY" as it should. So obviously there was some sort of more serious fault within the electronics.

Our goal this day was to remove the electronics and send them in for in-depth troubleshooting and repairs. Dale and I have previously successfully removed the electronics of the Norm Utke 7" Mak and my own 10" LX200 and sent them in for repairs. So we felt confident we could be successful with Roy's scope too.

Alan, Dale and Roy work on the telescope.

In any event, once the circuitry is repaired and returned, we will have another session to reinstall everything and verify successful restoration of functionality. So keep your fingers crossed that we can restore Roy's "baby" to full functionality!

If anybody is interested in witnessing or helping out with reinstallation of the electronics, let me know. I'll inform you of the time we will do the work so you can participate, if you want to.

Alan Sheidler

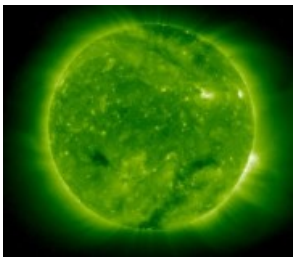
Solar specialist to give presentation at May meeting

Dr. Terry Kucera is an astrophysicist at NASA's Goddard Space Flight Center in Greenbelt, Maryland, where she has worked for over 25 years. She studies various aspects of the solar atmosphere, utilizing data from a wide variety of missions and telescopes. She is currently a STEREO project scientist and a member of the Solar Orbiter science team. Her research interests center on the solar atmosphere, especially solar prominences and prominence cavities.

Dr. Kucera came to NASA/Goddard in 1993 after receiving her doctorate from the University of Colorado, where she studied radio emissions from solar flares. She followed this with a post-doctoral fellowship studying X-ray flare emissions. Her post-secondary education also includes a bachelor's degree in physics earned in 1987 from Carleton College in Northfield, Minnesota.

During her career, Dr. Kucera has been detailed at NASA Headquarters as the Solar Discipline Scientist and the Science Mission Directorate Education and Public Outreach Manager. Here's a summary of the presentation she has planned for PAC's May meeting:

We take the Sun for granted, but this dynamic variable star exhibits a range of active phenomena, from sunspots to flares to coronal mass ejections, and our Earth is embedded in its outer atmosphere. I'll give an overview of the Sun and solar wind with a focus on how we observe them from various vantage points in the Solar System.



An image of the sun taken by NASA, showing solar flares and the solar wind.

Using filters to take solar images: One member's experience

Some solar images that Ken Boquist took recently using H-alpha and Calcium K filters can be found on page 10. Here are some of his comments:

The sun wasn't that interesting in H-alpha that day. Thus I shot the sun using a camera with a focal reducer to get the whole disk.
The sun was more interesting in Calcium K. Because of this, I decided to remove the focal reducer, which is why the 17:02 shot is so much bigger than the H-alpha image. Unfortunately it is too big for the camera to see it in its entirety. However, this portion was the interesting portion. I took a second shot to try and stitch the images, but I have not been successful to date getting good stitches.

The 17:11 and 17:17 images are just close-ups using a Barlow.

The two views (H-alpha and Calcium K) at first glance are somewhat similar. However, you can see that there is more detail visible in the large white area near the lower right, and the 17:17 shot clearly shows two sunspots that aren't really visible in the H-alpha image. Incidentally, the two sunspots were not visible in white light either. One other thing that may be noticed is that in Calcium K, one sees a lot more of the tiny little white spots and filaments across the sun's disk.

In case someone is interested in a Calcium K filter, keep the following in mind:

- The calcium K filter module from Lunt does not work in a Lunt dedicated solar scope. I actually removed the H-alpha module from my Lunt scope, and it didn't work. It requires a separate "ordinary" refractor that must have its aperture reduced to 4" or less. I knew this when I bought my calcium K filter, but Lunt doesn't really explain this on their website. My images were shot at 1.5" (actually greatly improves sharpness, and due to the

Continued on page 8

Donate to PAC through Birdies for Charity

The John Deere Classic golf tournament is scheduled for July 5-11 this year. Donating through Birdies for Charity is one of the best ways to support your favorite charitable organization because of the additional bonus amount of 5% or more added to your donation.

The process is somewhat different this year. Donations for 2021 do not depend on the number of birdies made, and are requested as a fixed amount paid with the donation form. The number of birdies can be guessed, but only for the grand prize of a two-year Lexus lease.

The easiest way to contribute is to go to www.birdiesforcharity.com and donate online. Click on "Donate." Then click on "Please select a charity…" and select "2046: Popular Astronomy Club" from the alphabetized drop down menu, then click "Add Charity". Fill in the rest of the online form with your contact information, payment information, and billing information. The minimum online donation is $20.

If you prefer not to donate directly online, you can go to the Birdies for Charity website, click on "charity", then on "Pledge Forms" to obtain a form. Enter "Popular Astronomy Club" and Birdie Number 2046 onto the form, and complete the other information. Mail the completed pledge and payment to the address stated on the form.

Donations must be received by the tournament office by June 21.

Any Birdies contribution is guaranteed to have an additional 5% donation or more from the Birdies for Charity Bonus Fund.

Dale Hatchel

Solar imaging

Continued from page 7

pixel size of my imager, I had to reduce the aperture to get a short enough exposure to not blow out the sun).

- The filter is really intended for imaging only. I have read that very young people might see some detail, but most people won't. I looked at the sun visually when I first got the filter, and all I could see was an extremely faint, violet sun. No detail could be seen.
- Because Calcium K is a monochromatic light source, images are best taken with monochromatic imagers. That is why my images aren't red for the H-alpha or violet for the Calcium K images. For that matter, all of the major observatories that make their images available to the public use monochromatic imagers as well.

ASTRO-CAT

As club president Alan Sheidler was getting the PACMO's telescope ready for use , he left the storage bag open long enough for Catten, the Sheidler family cat, to jump in and find a nice hiding place. Catten seem purr-fectly content to hang out on the nice foam surface, and we wonder if this isn't the fur-st time the feline tried to make friends with some astronomical gear.

ASTRONOMY AND SPACE HISTORY – IT HAPPENED IN MAY

May 2, 1969: A dedication ceremony is held at the new John Deere Planetarium on the campus of Augustana College in Rock Island. The building also contains an observatory named in honor of Carl Gamble, the founder of the Popular Astronomy Club, who bequeathed his observatory equipment to Augustana upon his death in January 1958.

May 5, 1961: At Cape Canaveral in Florida, Alan Shepard is strapped into a capsule known as Freedom 7 and launched aboard a Redstone rocket, making him the first American to travel in space. Shepard's suborbital flight took him 116 miles above the Earth's surface and lasted about 15 and one-half minutes. Ten years later, Shepard become the fifth man to walk on the moon, and the only of the original Mercury astronauts to do so.

May 8, 2001: The second XM satellite, known as "Roll," is launched from a floating platform in the equatorial Pacific Ocean. XM's first satellite, named – you guessed it – "Rock" had been launched two months earlier. XM's satellite radio service began broadcasting on September 25, 2001, more than four months before its competitor, Sirius. The two companies went on to merge in 2007.

May 16, 1925: Birth date of Nancy Grace Roman, an American astronomer who was NASA's first female executive and first Chief of Astronomy. Roman is credited with many significant discoveries, including that stars made of hydrogen and helium moved faster than those composed of other heavier elements. She was nicknamed the "Mother of Hubble" for her role in championing and planning the Hubble Space Telescope. Later this decade, NASA plans to launch the Roman Space Telescope, which will perform missions such as studying dark energy, measuring cosmic acceleration, and imaging exoplanets.

May 25, 1961: Speaking at a joint session of Congress, President John F. Kennedy calls for an ambitious space program that includes putting an American on the moon before the end of the decade. Though he would not live to see it, his goal was achieved with five months to spare on July 20, 1969.

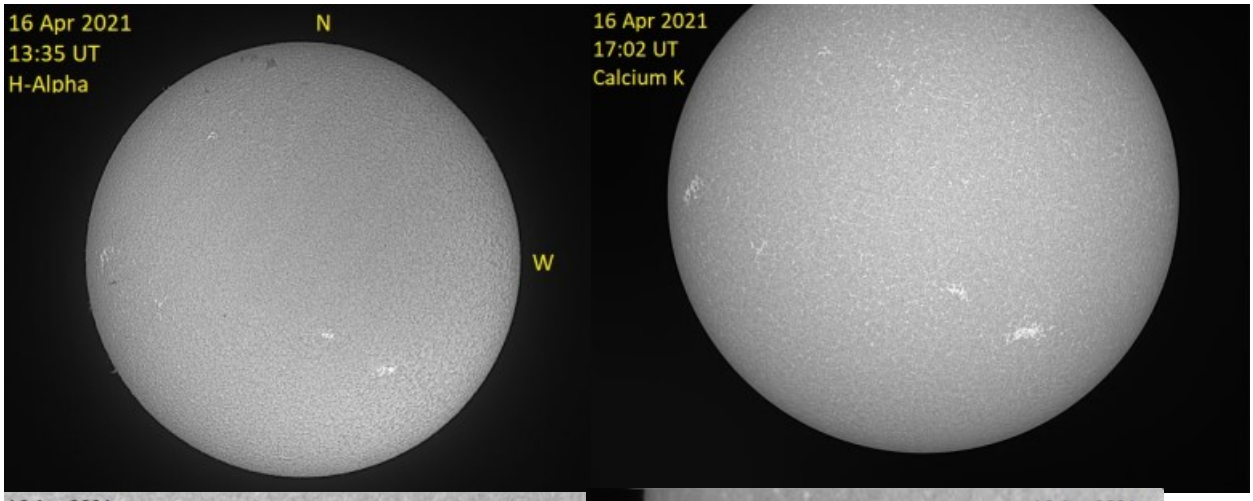
May 28, 1959: Able, a male rhesus macaque, and Baker, a female squirrel monkey, are launched by NASA on a spaceflight that takes them to an altitude of over 300 miles and subjects them to over 38 g's of force. Both monkeys survive the flight, becoming the first primates to do so, which made them instant celebrities. Able died just three days after landing during unsuccessful surgery to remove an infected medical electrode. Baker lived to age of 27, dying in November 1984; she is buried on the grounds of the U.S. Space and Rocket Center in Huntsville, Alabama.

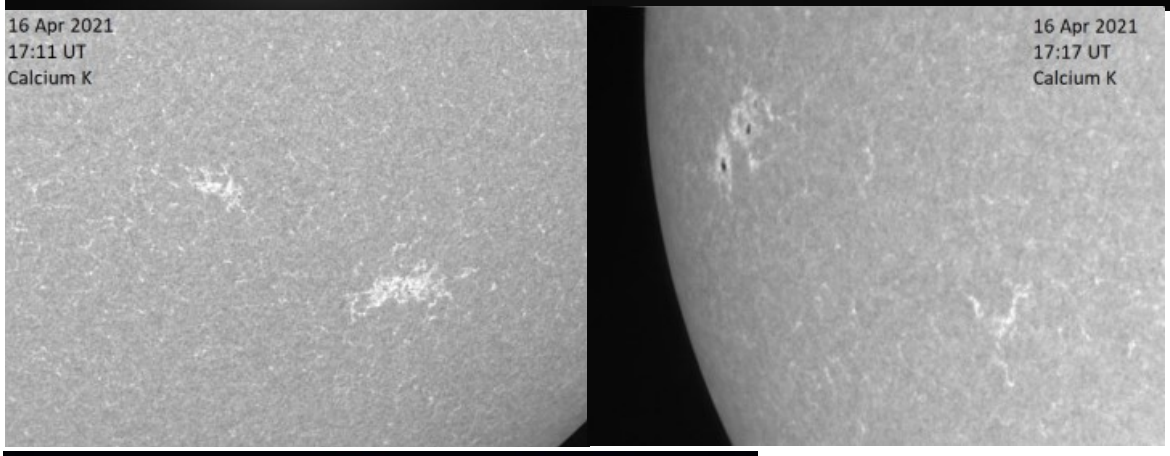
May 29, 1919: An experiment performed during a solar eclipse by British astronomers Frank Dyson and Arthur Eddington provides proof that Albert Einstein's general theory of relativity is correct. Two teams of observers, based in Brazil and off the coast of Africa, collected data showing that gravity does indeed deflect light when it passes a massive object. Though some astronomers criticized the accuracy of the observations at the time, later experiments performed using advanced instruments verified the results.

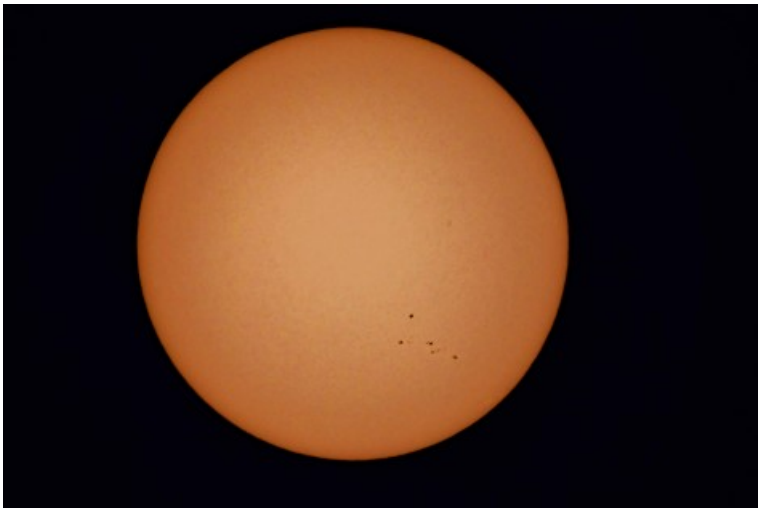
May 240 BCE: Records compiled by ancient Chinese astronomers state the appearance of a comet in the east; it is now generally believed that this is the first recorded observance of an object now known as Halley's Comet.

SOLAR IMAGES TAKEN BY KEN BOQUIST

For details, see page 7







Alan Sheidler did some solar observing on April 27 and was surprised to find this nice group of sunspots. From Al: "The image was taken with an ETX -90 telescope, FL = 1250mm, using a white light filter, and a Nikon D7500 camera, IS0 1000, with exposure time of 1/1000 sec. I am hoping the sun continues to generate spots so that we have some interesting images of our nearest star we can show to visitors at the Putnam's 'Gateway to Space' event on June 12th & 13th. In any event, take advantage of the clear skies and watch how these sunspots change over time."

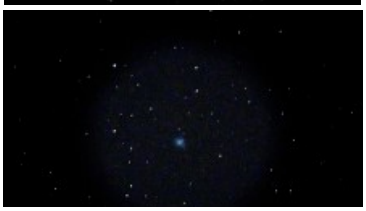
IMAGES TAKEN AT NIABI ZOO ON APRIL 17

These photos were taken with the PACMO's 12-inch LX200, using a Nikon D7500 camera and a focal reducer providing a focal length of 1920mm. Shown are (left, from top) the M3 globular cluster; the Sombrero galaxy (M104); the Camel's Eye nebula (NGC1501); the crescent moon; and the Ghost of Jupiter nebula (NGC3242).

IMAGES TAKEN AT PAUL CASTLE ON APRIL 3

A group of PAC members and guests got together at Paul Castle Observatory on April 3, a chilly early spring Saturday night. The wind was calm but conditions were short of ideal due to a slight haze in the air. Shown in the group photo are Steve Sinksen, Alex Holt, Tim Holt, Hugh Holt, Mary Holt, Rusty Case, Ally Nordick, Chris Nordick, Ken Boquist and Al Sheidler. Gary Nordick was also there but not in the photo. In addition to the observatory scope, five telescopes were set up in the grass. Al took the opportunity to photograph a number of planetary nebulae and globular clusters on the Astronomical League's observing list; some of the images taken are shown on this page.

(Left, top to bottom) M5 Rose Cluster; M53; M79; M97 Owl Nebula; (center, top to bottom) NGC2298; NGC2419 Intergalactic Tramp; (below, from top) NGC2438; NGC4361



May 2021

Hello, old friend!

A long time ago, while I was writing my biography of Clyde W Tombaugh, discoverer of Pluto, I learned from him that he had discovered other objects during his long search at the Lowell Observatory in Flagstaff, Arizona. He found many asteroids during his time at Lowell Observatory, at least one comet, and, surprisingly enough, one nova.

In February 1986, I visited Flagstaff in an effort to locate the nova that he found. It was a painstaking, tedious task but I loved it anyway. Because Clyde had been so careful recording his observations from each photographic plate onto the envelopes surrounding that plate, I had only to read through all the notes from each envelope. On one of the envelopes covering the year 1931, I saw the nova on a plate dated March 23 of that year. He remarked that must be "quite an interesting star to brighten from fainter than fifteenth magnitude in less than a day."

I later found nine other observations of this star while going through old plates at the Harvard College Observatory, and then I reported them all to Brian Marsden, then director of the Central Bureau for Astronomical Telegrams. He said, "I will announce it, but not yet."

"Why not?" I asked.

"Because you are an amateur astronomer."

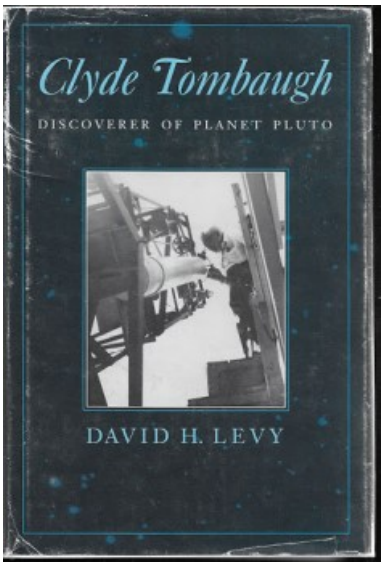
Them's fighting words. But before I had a chance to use them, he said, "If you were a professional astronomer, you would never look at the field again, and that would be the end of it. But as an amateur astronomer, you have a lovely 40 centimeter (16-inch) telescope with which you can observe the field every night. When the star erupts again, you will catch it, and then I will announce it as a current item!"

Six months later, on March 23, 1990, I saw the star in outburst with that telescope. It was 59 years to the day after Clyde's discovery, and I was thrilled to let the discoverer know of it.

The observation and history were announced in a subsequent announcement card. Since then, I have seen the star in outburst over and over again, and one of those sightings was on another March 23, which by this time had assumed more than one new significance: It is also the discovery date of our most famous comet, Shoemaker-Levy 9. It is also our wedding anniversary

TV Corvi is now my favorite variable star. On each clear night, I check the field. One time I caught the star so early in its brightening that I was able to create a movie of the event.

When there is an always welcome outburst, it is fun to say hello to my old friend, and I really have a feeling that the star answers me, from the depths of space, with a cosmic "hi there!" right back.

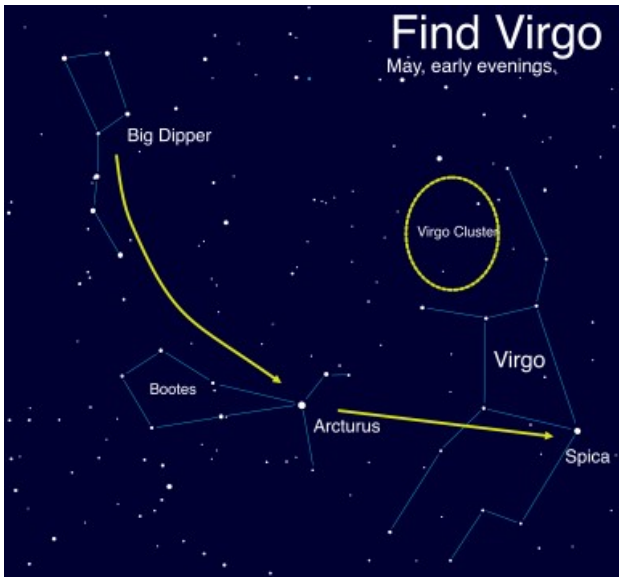


A well-worn cover of David Levy's 1991 biography of astronomer Clyde Tombaugh.

Virgo offers a rich bounty of constellations

May is a good month for fans of galaxies, since the constellation Virgo is up after sunset and for most of the night, following Leo across the night sky. Featured in some ancient societies as a goddess of agriculture and fertility, Virgo offers a bounty of galaxies as its celestial harvest for curious stargazers and professional astronomers alike.

Virgo is the second-largest constellation and largest in the zodiac, and easily spotted once you find Spica, its brightest star. How can you find it? Look to the North and start with the Big Dipper! Follow the general curve of the Dipper's handle away from its "ladle" and towards the bright orange-red star Arcturus, in Boötes – and from there continue straight until you meet the next bright star, Spica. This particular star-hopping trick is summed up by the famous phrase, "Arc to Arcturus, and spike to Spica."



This large constellation is home to the Virgo Cluster, a massive group of galaxies. While the individual stars in Virgo are a part of our own Milky Way galaxy, the Virgo Cluster's members exist far beyond our own galaxy's borders. Teeming with around 2,000 known members, this massive group of galaxies are all gravitationally bound to each other, and are themselves members of the even larger Virgo Supercluster of galaxies, a sort of "super-group" made up of groups of galaxies. Our own Milky Way is a member of the "Local Group" of galaxies, which in turn is also a member of the Virgo Supercluster.

In a sense, when we gaze upon the galaxies of the Virgo Cluster, we are looking at some of our most distant cosmic neighbors. At an average distance of over 65 million light years away, the light from these galaxies first started towards our planet when the dinosaurs were enjoying their last moments as Earth's dominant land animals. Dark clear skies and a telescope with a mirror of six inches or more will reveal many of the cluster's brightest and largest members, and it lends itself well to stunning astrophotos.

This image of the Virgo Supercluster was taken at the Palomar Observatory in California.

Virgo is naturally host to numerous studies of galaxies and cosmological research, which have revealed much about the structure of our universe and the evolution of stars and galaxies. The "Universe of Galaxies" activity can help you visualize the scale of the universe, starting with our home in the Milky Way before heading out to the Local Group, Virgo Cluster and well beyond. You can find it at: https://nightsky.jpl.nasa.gov/download-view.cfm?Doc_ID=389

You can further explore the science of galaxies across the Universe, along with the latest discoveries and mission news, at nasa.gov.

David Prosper

This article is courtesy of NASA's Night Sky Network program, which supports astronomy clubs across the USA and is dedicated to astronomy outreach. Visit nightsky.jpl.nasa.gov to learn more.

Meeting features archeoastronomy presentation

The monthly meeting of the Popular Astronomy Club on April 12 was another "hybrid" meeting, with both in-person attendance at the Butterworth Center and other members and guests attending virtually via Zoom

Eight people – including PAC's newest members, Natalie and Nicholas Foley – were in attendance at the Butterworth Center, while about 40 other PAC members and guests attended via Zoom. Many guests came from other amateur astronomy organizations, including the Quad Cities Astronomical Society, Peoria Astronomical Society, Rockford Amateur Astronomers, Twin Cities Amateur Astronomers, and Southeastern Iowa Astronomy Club.

The meeting began with brief announcements and then continued with a presentation by Bill Iseminger, who recently retired as Assistant Site Manager in charge of exhibits, interpretation, public relations, and intern programs at Cahokia Mounds State Historic Site near Collinsville, Illinois. His presentation was titled "Skywatchers of North America," during which he discussed the possible astronomical alignments of the mounds and other structures found at Cahokia, once a thriving metropolis with as many as 15,000 residents.

A video of the meeting has been posted to YouTube and is available here: https://www.youtube.com/watch?v=zT8ElOe9NzA

Unfortunately, the Zoom connection to Bill Iseminger failed before the question and answer session. Below are questions received from attendees of the PAC meeting; the questions were relayed to Bill, and here are the answers.

What happened to the Cahokia mound builders? Were they driven out as Europeans came on the scene, or was there another cause of their demise?

The demise of Cahokia seems to be gradual, beginning a little before AD 1200, and the site was basically empty by the mid-1300s. Several contributing factors were probably involved, rather than a disaster; these factors include climate change affecting crops; depletion of resources in the region with so many people needing the same things (Cahokia probably had at least 10,000 to 15,000 inhabitants and you could double that number if you include all the other communities in "Greater Cahokia"); increased conflict and warfare throughout the Mississippian world; extended droughts in the 1100s and 1200s, which would affect natural flora and fauna as well as crops; increased disease and health problems from so many people living in close proximity; and political changes, possibly a few bad leaders.

Repair work is underway at Monks Mound, the largest found at Cahokia. Mounds.

These are a few possibilities that, in combination, eventually led to the breakdown of the city. Where the inhabitants of Cahokia all went is unclear, as they all didn't just die out, but instead dispersed in all directions, establishing new, smaller communities in some cases, or joining relatives in existing ones.

It is not clear yet which tribes are descendants of Cahokia, although many feel a connection. Most notably are some of the Central Siouan speaking groups such as the Osage, Ponca, Omaha and others. The Osage have been the most vocal about being connected to Cahokia, based on oral traditions. These groups also have a lot of the same iconography, cosmology, and mythology that we see represented in the artwork and symbols of Cahokia and other Mississippian sites. In any event, Cahokia was long abandoned before the arrival of Europeans.

Continued on page 16

Archeoastronomy presentation

Continued from page 15

Do we know how these mounds were built and how long it took to build them?

The mounds were all built by hand, a basket-load of dirt at a time, carried on the backs of the Cahokians from the many borrow pits around the site. The dirt was dug with stone hoes, digging sticks, and other tools.

When excavating a mound we can often see construction techniques, including stacked individual basketloads of different colored soils; in other instances, instead of piling up the loads, they strewed it in thin layers, often alternating light, medium, and dark colored soils that came from different sources, or different colored layers of soil deposits in the borrow pits.

Why have the mounds lasted so long?

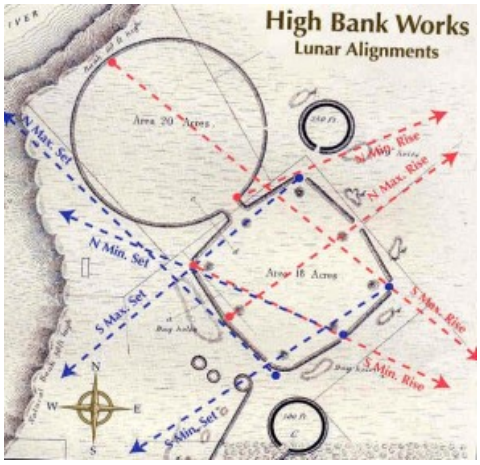
I guess we are somewhat lucky that we have as many surviving as we do. Of the original 120-plus mounds, about 80 survive today. Many were plowed down, and others destroyed by highways, subdivisions, discount stores, etc.; some even had houses built on top of them. Mother Nature has also taken a toll with erosion and weathering. So, very few have escaped much modern impact and many are probably about half their original height, especially the smaller ones.

Why were they built at these specific locations?

We are not sure but there must be reasons for the placement of many of them. Often, a number of mounds are arranged around plazas; others can be seen in general rows aligned along east-west and north-south axes.

Monks Mound, the largest, is basically at the center of the site, and many other mounds are arranged in relationship to it. Others occur in clusters that may be related to kin groups, or neighborhoods of related people. Some may mark important locations.

We often see that prior, to the construction of a mound, there were ceremonial or special structures at those locations, showing the location was already important, for whatever reason. Perhaps as people or groups from other areas moved into Cahokia, they established their own “barrios” or neighborhoods (much like cities today) with their own mound complexes.



Is there any information or even speculation, on how the native Americans designed these structures? The positioning of the woodhenge posts, particularly for the moon sightings, must have taken many years of observing cycles to measure and verify positions before they had calendars.

Lunar alignments indeed would take many years, at least 18 and a half, to determine the maximum and minimum positions of moonrises over a full cycle. However, solar alignments can be observed in one year's time. There were probably specialists ("priests") who were responsible for making these observations and developing the rituals and ceremonies associated with them, and they probably were also responsible for designing the structures that capture and document those movements, including the placement of mounds, posts, and structures.

At the Highbanks Park mound and structures near Columbus, Ohio, which I visited several years ago, the structures were believed to be mostly defensive, and I don’t recall any mention of the astronomical or calendar purpose. Is there new information recently that indicated the calendar and astronomy uses of this site?

There are two similarly named mound sites. You probably visited Highbanks Park Mounds, an earthen embankment that has had very little archaeological work done, so not much is known about it. The other is the High Bank Works; this is a complex of earthen enclosures and causeways that do appear to have lunar alignments, as seen in the diagram above.

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Astronomical League Observing Programs

If you'd like to earn some recognition for your observing skills, the Astronomical League currently offers more than 70 different observing programs. The programs are designed to provide goals and directions for your observations and cover a full range of observable objects and skill and experience levels. You can earns certificates and pins for completing the programs. Click on the link above to find an alphabetical list of observing programs, from "Active Galactic Nuclei" to "Youth Astronomer.

Note that his year, in celebration of its 75th anniversary, is offering a special challenge to observers; complete this program, and you can earn the 75th Astronomical League Anniversary Certification.

CLICK HERE FOR BACK ISSUES OF REFLECTIONS

CLICK HERE TO CONNECT WITH PAC ON FACEBOOK

CLICK HERE TO JOIN PAC OR RENEW YOUR MEMBERSHIP

CLICK HERE FOR A HISTORY OF PAC THROUGH 2000

SUBMISSIONS WELCOME!

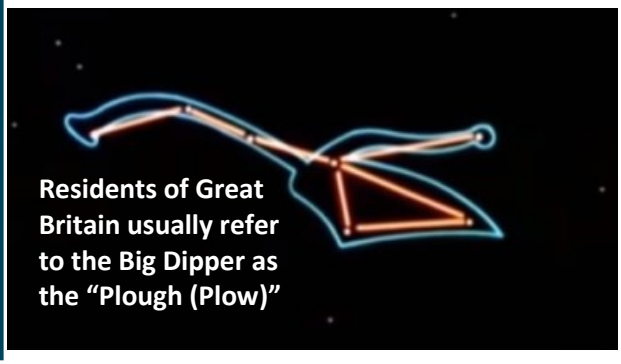
We want to hear from you! If you have an article or photos to submit, or other items of interest, send them along to Reflections. Please send what you have to share no later than the 25th of the month, sooner if possible. Photos and other images should be sent as separate files rather than embedded in emails. Send to levesque5562@att.net

Thank you!

Click here to go to the Astronomical League website

PAC belongs to the North Central Region of the Astronomical League; click here to check out NCRAL's website.

ASTRO-TRIVIA ANSWER



Residents of Great Britain usually refer to the Big Dipper as the "Plough (Plow)"

UPCOMING EVENTS

Date: May 10, 2021

Event: Regular Meeting @ 7 p.m.
Location: Zoom / Butterworth Center

- **Program : 'Views of the Sun and Solar Wind ' by Dr. Theresa Kucera** ***(see page 7)***

All these events, dates and times are tentative and subject to change! Please check your emails for any updates and changes!

The May 10 meeting will once again be a 'hybrid' meeting, with limited in-person attendance at the Butterworth Center and all others welcome to attend virtually via Zoom. Contact Alan Sheidler if you plan to attend in person. MORE UPCOMING EVENTS:

- **May 15:** Outreach at Niabi Zoo; sunset
- **June 5:** Outreach at Giant Goose Conservation Area in Atkinson, Illinois; 9 a.m. to 1 p.m.
- **June 12-13:** Outreach at 'Gateway to Space' weekend at Putnam Museum, Davenport; 10 a.m. to 5 p.m. Saturday, noon to 5 p.m. Sunday
- **June 14:** PAC Regular Meeting at the Butterworth Center / Zoom at 7:00 p.m. Presentation via Zoom: "Association of Lunar and Planetary Observers" by Matthew Will, Secretary and Treasurer of ALPO.

MONTH	NEWSPAPER ARTICLES	CONSTELLATION REPORT	PROGRAM
JUN 2021	Frank Stonestreet	AVAILABLE	Presentation: "Association of Lunar and Planetary Observers" by Matthew Will, ALPO Secretary & Treasurer
JUL 2021	Bryan Raser	AVAILABLE	Green Bank Observatory. Green Bank, West Virginia - Virtual Tour and Current Projects
AUG 2021	Matt Neilssen	AVAILABLE	Annual PAC Picnic
SEPT 2021	Jim Rutenbeck	AVAILABLE	Business Meeting; Smorgasbord of Member Presentations
OCT 2021	AVAILABLE	AVAILABLE	Annual PAC Banquet; Presentation: "Lunar Laser Ranging Project" by Dr. Russet McMillan, Apache Point Observatory, New Mexico
NOV 2021	AVAILABLE	AVAILABLE	Presentation: "M Dwarf Stars and the James Webb Space Telescope" by Katie Melbourne, Ball Aerospace Systems, Broomfield, Colorado
DEC 2021	AVAILABLE	AVAILABLE	The Year in Review — Roy Gustafson
JAN 2022	AVAILABLE	AVAILABLE	Presentation: "Curiosity Paving the Way for Perseverance" by Dr. Rebecca M E. Williams, Planetary Science Institute
FEB 2022	AVAILABLE	AVAILABLE	Presentation: "Seeing Stars: How Birds Use the Night Sky During Migration" by Dr. Jennifer C. Owen, Corey Marsh Ecological Research Center, Michigan State University
FEB 2022	AVAILABLE	AVAILABLE	Business Meeting; Smorgasbord of Member Presentations