



Reflections

The Newsletter of the Popular Astronomy Club

ESTABLISHED 1936



June 2021

President's Corner: June 2021



Alan Sheidler

Welcome to another edition of Reflections, the newsletter of the Popular Astronomy Club. Spring has sprung and with it has come relatively warmer evenings. Spring typically

also is our rainy season, and for us here in the Midwest at least, there has been ample rainfall which is good for the farmers, but not so good for stargazers. Despite the surfeit of cloudy nights this season, we have nonetheless had several excellent club observing sessions, which you can read about here in this newsletter.

We had two nice club observing sessions at the Paul Castle Observatory, one on May 7th and then another on May 13th. Both were very good sessions, but the May 13th session stands out for me. One of the goals I had for this session was to observe the planet Mercury and, if possible, take a picture of this elusive denizen of the inner solar system. I did succeed in capturing an image of Mercury, and while it is my personal best, it is not particularly good.

For me, Mercury is tough to image well. It never strays far from the sun so it is always very low in the sky either right after sunset or immediately before sunrise. Looking through the murky atmosphere near the horizon adds a high degree of instability to any observations.

Difficulties aside, mid-May was an excellent opportunity to view Mercury because it was at greatest elongation (the angular distance from the sun as viewed from earth). Also, because the ecliptic's angle with the horizon is steep this time of year, we had an excellent opportunity that night to view this elusive planet. In addition, on the evening of May 13, the crescent moon was positioned right alongside the planet Mercury at sunset, making it especially easy to find the planet in the western sky's twilight glow. This was a beautiful pairing of planetary objects.

These club observing sessions are fun and educational. I would definitely encourage you to come out and participate. The Paul Castle Observatory is available for any club member's use. I really like the fact you can walk in, open the dome, turn on the scope and start observing. The entire process only takes maybe five minutes: No pain and no strain.

If you would like to use the observatory, we do ask that you be trained in the safe use of the equipment. All club members are welcome and there is no cost. Just contact any board member to get going.

Because the COVID-19 pandemic is on the wane, PAC is also receiving outreach requests from the community and ramping up public events after a long hiatus in 2020. On May 18, we provided a Lights On for Learning event at John Deere Middle School. As luck would have it, it rained for this event, but we had alternative activities

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BIRDIES FOR CHARITY BENEFITS THE CLUB

There's still time to give to the Popular Astronomy Club through Birdies for Charity, the annual fund drive conducted in partnership with the annual John Deere Classic golf tournament.

June 21 is the deadline for giving through Birdies for Charity, with the tournament itself scheduled for July 5-11.

Unlike past years, donations for 2021 do not depend on the number of birdies made, but instead are requested as a fixed amount. The number of birdies can be guessed to qualify for a drawing for a grand prize of a two-year Lexus lease.

To donate online, go to www.birdiesforcharity.com and select "2046: Popular Astronomy Club" from the alphabetized drop-down menu. Then fill out the rest of the form. The minimum online donation is \$20. A form is also available on the website if you prefer to donate by mail.

All donations will receive an additional 5% or more from the Birdies for Charity Bonus Fund.

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](#)

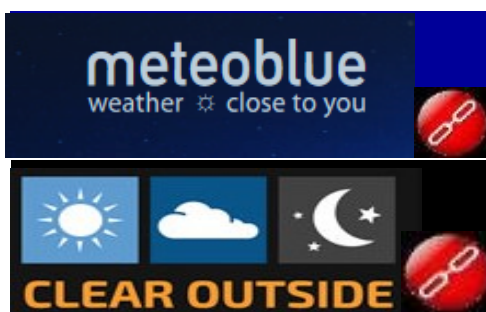
[NCRAL SPRING Seasonal Messier List](#)

[NCRAL SUMMER Seasonal Messier List](#)

[NCRAL AUTUMN Seasonal Messier List](#)

[NCRAL WINTER Seasonal Messier List](#)

HOW'S THE WEATHER?



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Virtual ALCON scheduled for August 19-21



The Astronomical League has announced that its annual convention will be held August 19-21 in a location that's become increasingly familiar for meetings – cyberspace.

The virtual convention is free, and you need not be a member of the Astronomical League or any other astronomy organization to attend.

The event will feature professional and youth speakers, virtual tours, an international star party, a business meeting, and a presentation on Slooh,

which operates a robotic citizen observatory located in the Canary Islands. Awards for both 2020 and 2021 will be presented, and over \$3,000 worth of door prizes will be handed out.

Keynote speaker at the convention will be Dr. Jocelyn Bell Burnell, an astrophysicist from Northern Ireland who is credited with discovering the first radio pulsars in 1967 while she was a post-graduate student.

To register for the convention, click on this link:

<https://www.astroleague.org/content/register-alcon-21-virtual>

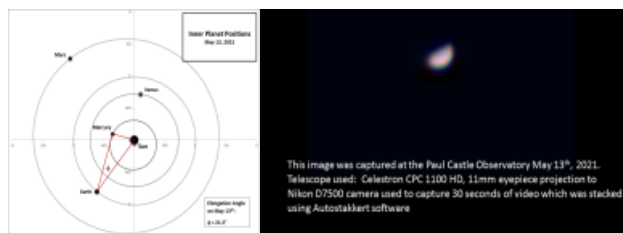
President's Corner: Capturing elusive Mercury

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which you can read about further on in this newsletter. It's nice to reengage our public outreach.

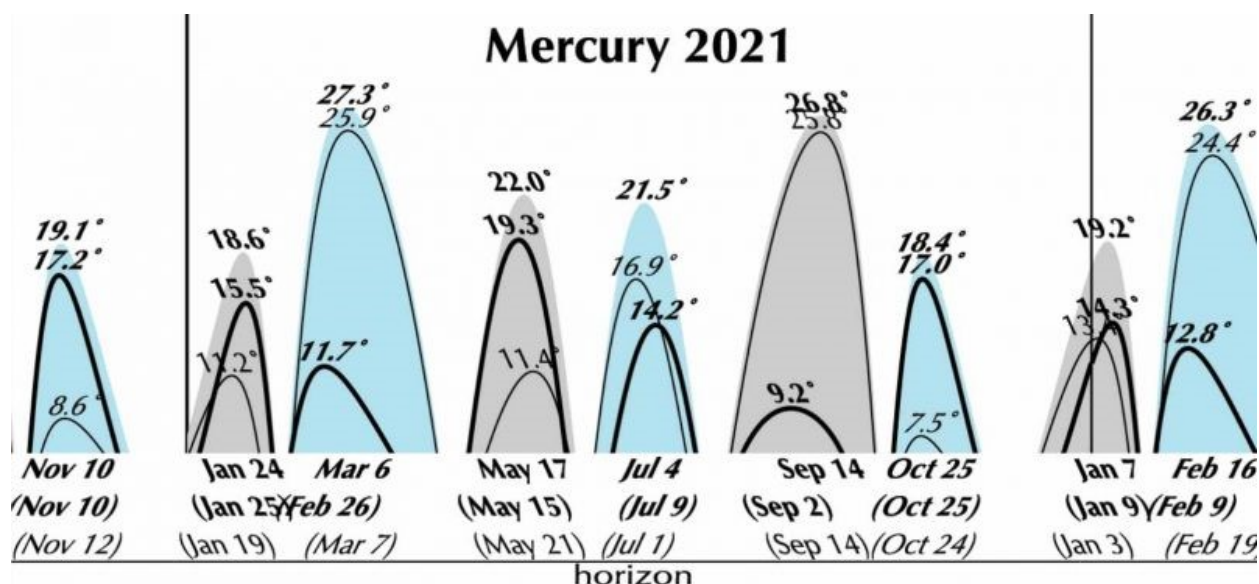
June promises to be an even better month for public events. We have events planned with Giant Goose Recreation Area on June 5, the Putnam Museum June 12 and 13 and of course our Niabi observing session is on June 19.

A little further down the road, we also have a request on July 31 to do an observing event at the Silver Bell Hollow alpaca farm near Illinois City. Hopefully the weather will cooperate for these events but either way, public enthusiasm for as-



astronomy is returning.

If you would like to be involved in any of these public events or attend one of the club observing sessions, please contact me or any of your board members. This could be the start of something big, really big! Keep looking up.



Enjoy the wonders of the June night sky

June is a good month for astronomical observing; the evenings are warm and the skies are clear (hopefully). Take a comfortable chair and go out at night and find an area away from city lights; it could be in your own backyard or after a short drive into the country.

Relax, face north, and look up at the night sky. Because the Earth is rotating, the sky seems to be too, causing the stars to change position as time passes. The stars also change position from our perspective as the Earth revolves around the Sun.

For example, at 9 p.m. on June 1 to the southeast you will see three bright stars forming a triangle; this is called the Summer Triangle. If you go out at 10:30 on June 15, the Summer Triangle will be due east and higher in the sky.

As June progresses, the summer triangle gets higher and moves counter-clockwise across the sky.

Let's use June 15 and 10 p.m. as our reference day and time. High in the eastern sky are the three bright stars forming the Summer Triangle: Vega, Altair, and Deneb. If you look at the top of the sky (called the zenith) at about the one o'clock position, the brightest



The Summer Triangle, which appropriately appears high in the night sky during June, is a familiar asterism, a term for a named group of stars that doesn't form a constellation.

star in the area is Vega, in the constellation Lyra. Vega is the fifth brightest star in the night sky.

Moving east from Vega, to about the two o'clock position, the next bright star is Altair in the constellation Aquila. Deneb, the final star in the summer triangle can be found at about the three o'clock position southeast of Vega. Deneb is in the constellation Cygnus and is the 19th brightest star in the night sky.

When you see Deneb, you're looking at light that left the star around 521 A.D., a time when the Roman Empire was in its final stages. So, when you look at celestial objects you truly are looking into the past.

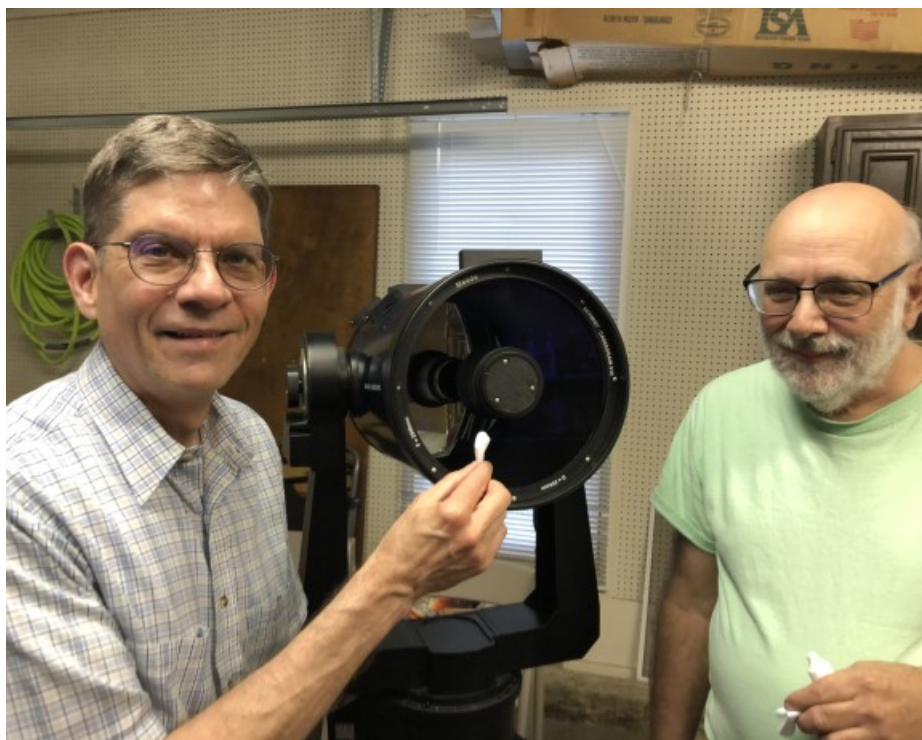
Still looking straight up to the zenith while looking south, you see a bright, red star; this is Antares, the brightest star in the constellation Scorpio. Antares is a red super-giant star, and it is truly gigantic. If Antares was at the center of our solar system, Mercury, Venus, Earth, and Mars would all be inside the star. The light you see left Antares 619 years ago, about the time of Joan of Arc.

Now swing back to the Summer Triangle and its three bright stars: Vega, Altair, and Deneb. The Summer Triangle is what is known as an asterism, a group of stars that

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The Big Dipper, the most famous asterism of all, can be used to find Polaris, the north star, found at the tip of another asterism known as the Little Dipper.



Keeping it clean

PAC president Alan Sheidler joined Terry Dufek recently in cleaning the collector plate (front lens) on Alan's telescope, a chore that Terry had performed on his own telescope. The lens cleaning, using supplies and expertise provided by Terry, gave the two a chance to work off a dinner served at the Sheidler home that ended with a dessert of key lime pie, Alan's favorite (now Terry's too). If you'd like to know how to clean your own collector plate, here's a link to an informative video:

<https://www.youtube.com/watch?v=loRrpM2Mldk>

June sky features asterisms

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that forms a pattern but doesn't form a constellation. An asterism can cover a large area of the sky and include stars in multiple constellations – such as the Summer Triangle – or it can be entirely within a constellation. The best example of the latter would be the Big Dipper, the most famous asterism of all, which is located within the constellation Ursa Major (the “Big Bear”). Note that a single star can also be part of two asterisms: Deneb is in both the Summer Triangle and another asterism known as the Northern Cross.

The Big Dipper is visible all year long at our northern latitude, and it's interesting to note that its stars – with the exception of the brightest and the star at the end of the handle – are all part of the Ursa Major moving group. The Ursa Major moving group contain stars that were born at about the same time and are moving through space together. The group is about 80 light-years away, meaning the light you see left a few months before America entered World War II.

The Big Dipper is useful in locating Polaris, the pole star. Polaris is located almost directly over the North Pole, from Earth's perspective, so lo-

cating it points you to the north. Find the two end stars of the Big Dipper and draw an imaginary line, and this line will point at Polaris.

Polaris is at the end of the handle of the Little Dipper, an asterism in the constellation Ursa Minor (the “Little Bear”). Polaris is 434 light-years away, meaning that the light you see left at about the time Mary Queen of Scots was executed.

Everything discussed in this article is visible to the naked eye. However, a pair of binoculars or a modest telescope can multiply your viewing pleasure, and leave you awestruck at the wonders of the universe. Get hooked on the night sky, and you'll always be “looking up.”

Anyone interested in the night sky is welcome to join the Popular Astronomy Club or take part in one of our activities. Learn more at our website: <https://www.popularastronomyclub.org>, or find us on Facebook.

The Popular Astronomy Club has resumed its regular public viewing nights, held the third Saturday of the month at Niabi Zoo. The next one is scheduled for June 19 beginning at about 8 p.m. We look forward to seeing you there!

Frank Stonestreet

The Planets in June 2021

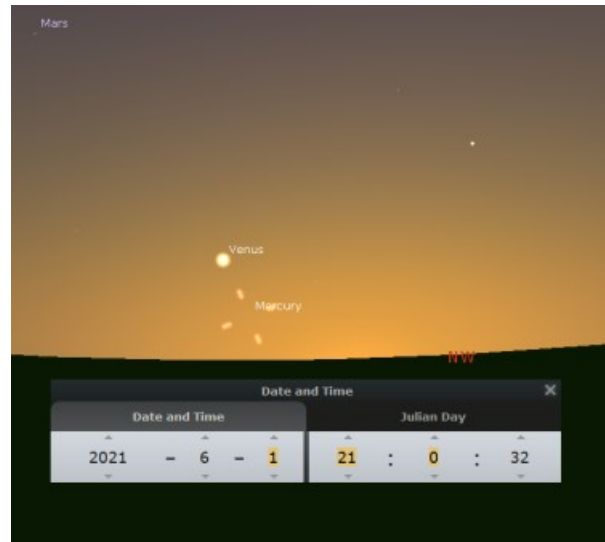
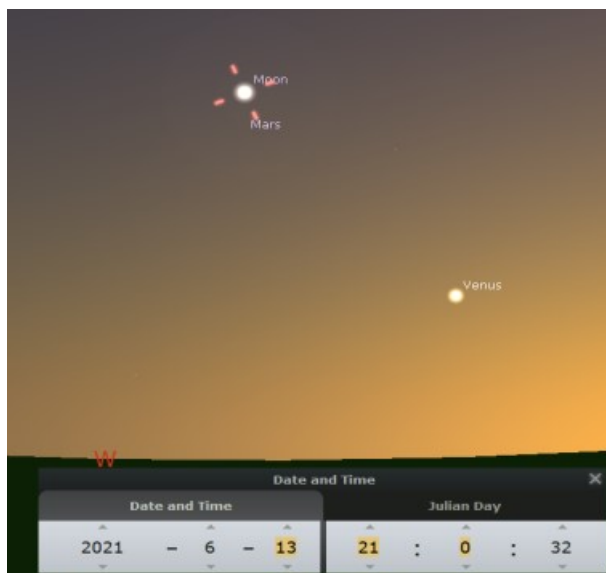
Mercury, Venus and Mars

Mercury on June 1 is located in the west-northwest sky at 9 pm. It is $5^{\circ} 11'$ below Venus and $3^{\circ} 4'$ off the horizon. It is very tough to catch, at mag. 3.36. But if you can see the pair, you might just catch Mars also.

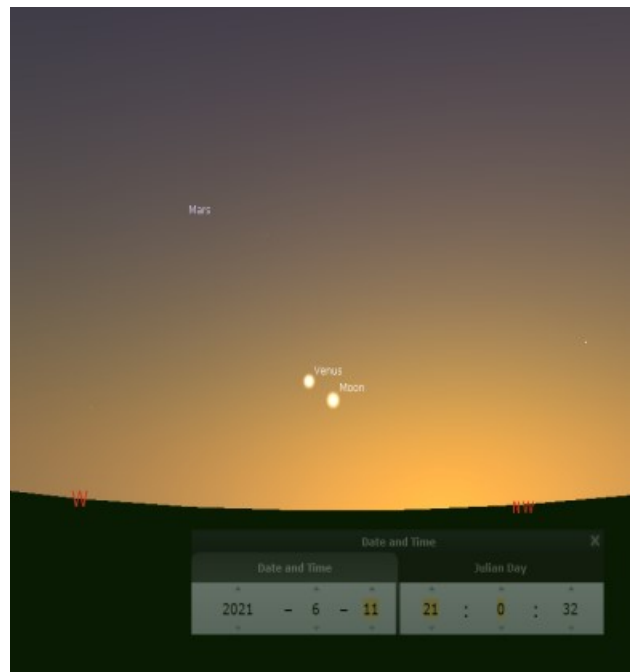
By June 20, Mercury has moved into the morning sky and can be seen just peeking over the east-northeast horizon at 5 a.m., shining at magnitude 3.04.



Mars starts off June 1 in the west north-western sky. It is magnitude 1.74 and is just above Venus and Mercury. On the 13th, the 3-day-old Moon passes just north of the red planet. Mars slowly sinks toward the horizon until it is about 7° from Venus on the 30th.



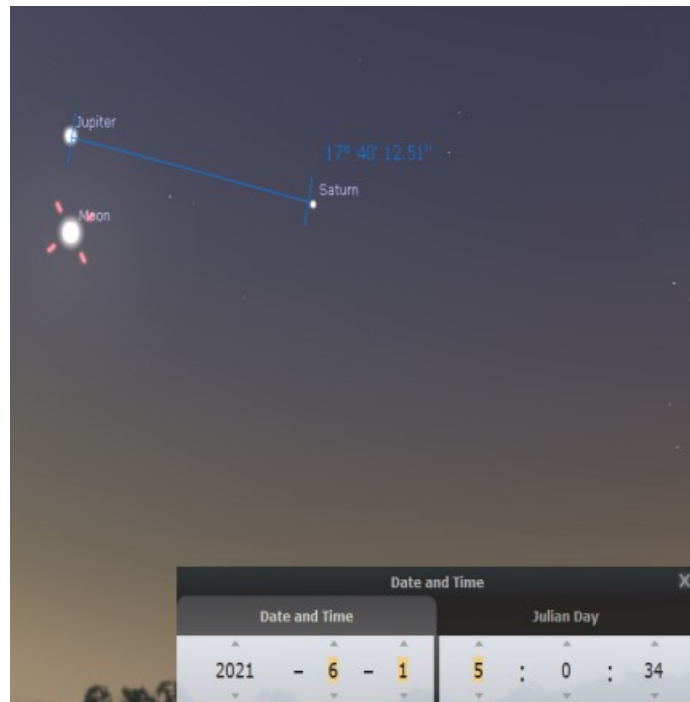
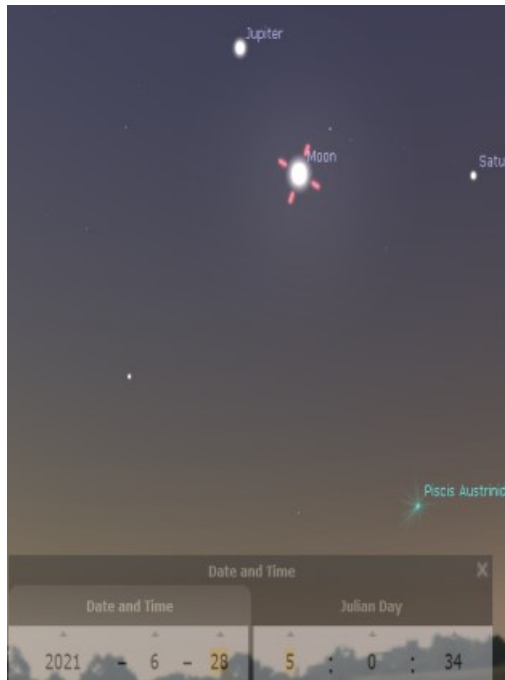
Venus on June 1 is glaring away in the northwestern sky at magnitude -3.85, at altitude $8^{\circ} 23'$. You might be sharp enough to catch Mercury below it before it moves into the sun's glare (seen above Stellarium diagram.). On June 11, catch the day-old Moon nearby at 9 pm. Mars is just above and to the left of the pair. Venus continues to stay in the same relative position the rest of the month.



The Planets in June 2021

Jupiter, Saturn, Uranus and Neptune

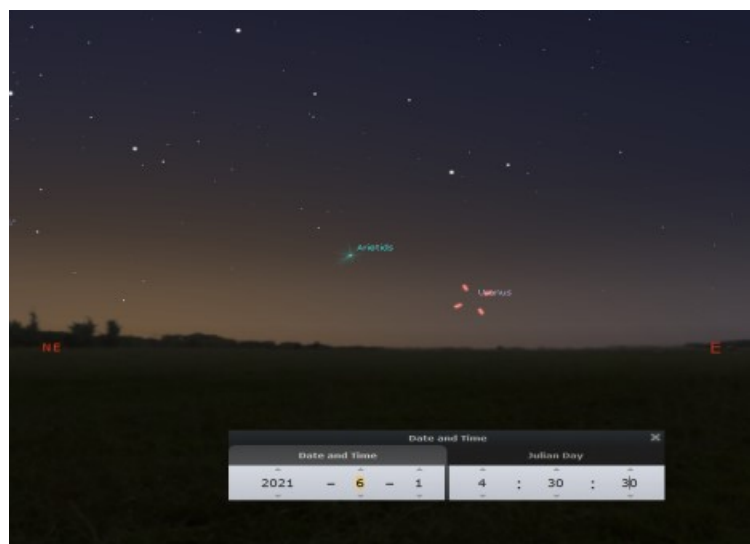
Jupiter is 32° above the south-southeastern horizon on June 1 at 5 am. The 21-day-old Moon is just 5° to the south of Jupiter. Saturn is just $17^\circ 40'$ to the west of Jupiter. The Moon returns to just south of Jupiter on the 28th.



Saturn is just 17° west of Jupiter on June 1. It is magnitude 0 and $29^\circ 4'$ off the southeastern horizon at 4:30 am. The Moon passes about 4° south of the planet on the 27th.

Uranus on June 1 peeks about 4° over east-northeastern horizon at 4:30 am. It's very dim at magnitude 5.86. The Moon passes about 2° east of Uranus on June 7th.

Neptune on June 1st is $24^\circ 44'$ above the south-east horizon at 4:30 am. It is faint at magnitude 7.90.



Spotlight Galaxy: NGC 2903

NGC 2903 is an isolated barred spiral galaxy in the equatorial constellation of Leo, positioned about 1.5 degrees south of Lambda Leonis. It was discovered by noted astronomer William Herschel, who cataloged it on November 16, 1784. He mistook it for a double nebula, as did subsequent observers. J. L. E. Dreyer assigned it the identifiers 2903 and 2905 in his New General Catalogue; NGC 2905 now designates a luminous knot in the northeastern spiral arm. This field galaxy is located about 30 million light-years away from the Milky Way, and is a member of the Virgo Supercluster. The morphological classification of this galaxy is SBbc, indicating a barred spiral (SB) with moderate to tightly-wound spiral arms (bc). De Vaucouleurs and associates assigned it the class SAB(rs)bc, suggesting a weaker bar structure (SAB) with a partial ring (rs). The bar structure appears stronger in the near infrared band. The galaxy is inclined by an angle of 60 degrees to the line of sight from the Earth.

72% of the stellar mass is located in the outer disk of the galaxy, and 20% is found in the bar. The bulge adds 5% of the stellar mass, and its star population is generally older. However, the central volume of the core is a strong starburst region. The star formation rate here is fed by gas inflow along the bar. There is no evidence of an active nucleus.

The irregular dwarf galaxy KKH 51 appears to be a companion, as they have an angular separation of 25' and nearly the same radial velocity.



John Deere Middle School hosts PAC

Event is first to be held under community partnership

Cloudy, rainy skies didn't dampen the enthusiasm of students and parents who attended an educational event held on May 18 at Moline's John Deere Middle School that was put on by the Popular Astronomy Club.

The event was the first held under a community partnership recently formed between PAC and the Moline School District. The terms of the partnership are outlined in a Memorandum of Understanding agreed to by PAC and the school district.

The MOU calls for PAC to hold four events a year at John Deere Middle School and officially designated the club as a "Community Partner."

Chad Potter, a science teacher at John Deere, serves as the district's primary point of contact for the partnership and hosted the event in his classroom. He is planning to form an astronomy club at the school.

PAC events held at the school will be done under the Lights On for Learning program, which provides education enrichment opportunities during evenings, weekends and other



The PACMO was parked in front of John Deere Middle School and available for tours, but unfortunately not observing.

times when classes are not in session.

Though the weather made the planned observing session impossible, the PACMO was parked in front of the school and made available for tours.

Inside the classroom, PAC member Jan Gustafson demonstrated the use of planispheres and other tools that can be used to find and identify constellations and other astronomical objects.

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During the event, Dino Milani gave a presentation on various types of telescopes, while Jan Gustafson demonstrated the use of planispheres.



PAC event at John Deere Middle School

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Dino Milani gave a presentation on the different types of telescopes and how they work. Several telescopes were set up in the hallway outside the classroom, with PAC members discussing how they used them.

PAC president Alan Sheidler presented a slide show on PAC and showed some of the astro-photos taken by club members. He reported that, during a tour of the PACMO, one of the students told him that the event had inspired her to consider a career in astronomy.

"It is gratifying to see our efforts have such a positive impact on our youth," Alan said. "Thanks to all the PAC volunteers who came out that night, and thanks to Mr. Potter and the Moline School District for hosting the event and for their outstanding support."



PAC president Alan Sheidler discusses the club during the May 18 event at John Deere Middle School.

The next event under the PAC-John Deere Middle School partnership will probably be held in the fall, pending stated approval of a grant for the Lights On for Learning program.

Paul Levesque

ALPO officer headlines June PAC meeting

The June meeting of the Popular Astronomy Club will feature a presentation by Matthew Will, who serves as secretary and treasurer of the Association of Lunar and Planetary Observers.

ALPO is an international organization of amateur astronomers devoted to studying the Sun, Moon, planets, asteroids, meteors, and comets. The organization aim to stimulate, coordinate, and generally promote the study of bodies in the Solar System using methods and instruments that are available to both amateur and professional astronomers.

Will joined ALPO in 1973 and became a board member in 1998. He first took office as membership secretary and treasurer in 2001 and took on additional responsibilities as corporation secretary in 2004.

The Springfield, Illinois resident helped



Matthew Will has been an active member of the Association of Lunar and Planetary Observers since 1973.

coordinate ALPO's Lunar and Planetary Training Program. During his 48 years with the organization, he's made illustrations of the Sun, Moon, planets and other objects.

Will's presentation at the PAC meeting will provide an overview of ALPO and its mission, vision and operations, and how those interested can participate in and join the organization. More information is available at ALPO's website: <http://alpo-astronomy.org>

ASTRONOMY AND SPACE HISTORY – IT HAPPENED IN JUNE

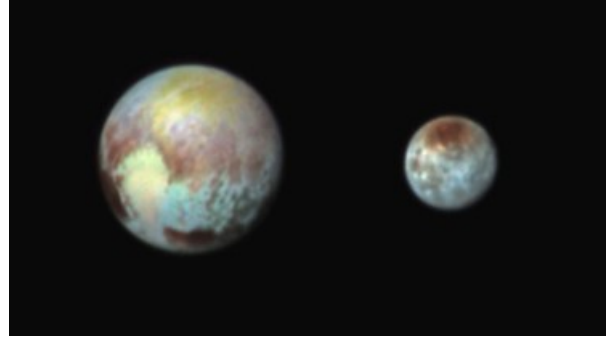
June 2, 1965: Surveyor 1 becomes the first U.S. spacecraft to make a successful soft landing on the Moon, four months after the Soviet Union achieved a similar feat with its Luna 9 probe. Surveyor's mission was to gather data about the lunar surface that would later be used for the planned Apollo crewed missions. Surveyor transmitted more than 11,000 still photos back to Earth along with video images, temperature readings and other data, and returned information to NASA through January 1967.



June 11, 1928: German pilot Friedrich Stamer straps himself into a rocket-propelled glider and becomes the first person to fly aboard an aircraft powered by a rocket. The flight in western Germany's Rhoen Mountains last about 70 seconds and carries Stamer a little over a mile; the rocket explodes during a subsequent flight, but Stamer escapes unharmed. He died in 1969 at the age of 71.

June 16, 1963: Valentina Tereshkova of the Soviet Union is launched aboard the Vostok 6 spacecraft and becomes the first woman to travel in space. Using the call sign

"Seagull," Tereshkova spent nearly three days in orbit and logged more space flight time herself than all American astronauts had up to that date. Tereshkova was awarded the Order of Lenin, made more than 40 goodwill trips abroad, achieved the rank of colonel in the Soviet Air Forces, and held several political positions, including as a member of the Central Committee of the Communist Party. Following the collapse of the Soviet Union, she lost an election to the Duma (the legislative body of Russia) in 1995; in 2011, she ran again and won the election, and still serves in the Duma today as a member of the United Russia party.



June 21, 1978: Working at the U.S. Naval Observatory in Washington, D.C., James Christy scans photographs taken at the observatory's station in Flagstaff, Arizona, and notices a bulge along Pluto's limb. The next day, Christy concludes that the bulge was a moon orbiting Pluto. Further research confirms Christy's discovery, and he names the moon Charon, a mythological ferryman who conveyed the dead across the River Styx to the underworld, realm of the Greek god Pluto; the name also begins with "Char," a nickname used by Christy's wife Charlene.

June 28, 1818: Angelo Secchi is born in Reggio Emilia in northern Italy; he proves to be such a precocious child that he joins the Jesuit novitiate in Rome at the age of 15, studying science and mathematics. Ordained as a priest in 1847, Father Secchi is briefly exiled to the United States the following year due to political unrest in Europe. In 1850, soon after his return to Rome, Father Secchi is appointed director of the Vatican Observatory, a position he held until his death in 1878. Secchi's contributions to astronomy include creating the first color illustrations of Mars, including maps of its "canali" – Italian for "channels" – and pioneering the use of spectroscopy to analyze stars.

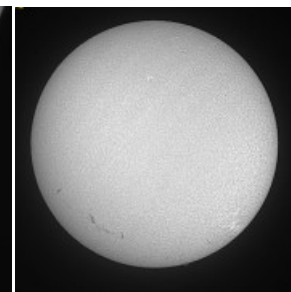
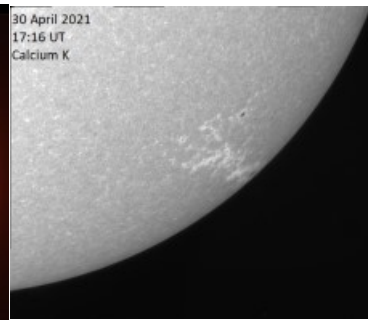
June 30, 1954: Members, friends and family members from the Popular Astronomy Club gather in the northern Wisconsin town of Cumberland to observe a total eclipse of the Sun. Totality begins shortly after sunrise and lasts one minute, sixteen seconds; afterwards, members of the PAC group enjoy breakfast and head home.



Ken Boquist captured these images of M83 (the Southern Pinwheel galaxy) on May 7; the image above illustrates the frustration he experienced as airplanes and satellites kept passing through the field of view.



Byron Davies went out on April 30 and took these astrophotos of Markanian's Chain—a string of galaxies in the Virgo Supercluster—and M101, the Pinwheel Galaxy.



Here's a selection of solar images taken by Ken Boquist on April 30; Ken notes that, when imaging the sun, monochrome images will generally show more detail than "pretty" color images.

MEMBER OBSERVATIONS

RESULTS OF MAY 7 OBSERVING SESSION



PAC members (from left) Alan Sheidler, Byron Davies, Ken Boquist and Rusty Case braved a chilly spring night at Paul Castle observatory to get these images, using the Celestron CPC 1100 telescope. In the left column, from top: M5 Rose Cluster; M12 globular cluster; the Scarab Nebula; the M107 Crucifix Cluster; plus an image of the sun taken earlier showing a few sunspots. In the right column, from top: M4 Crab Cluster; the Ghost Cluster; IC4593; and the Ghost of Jupiter.

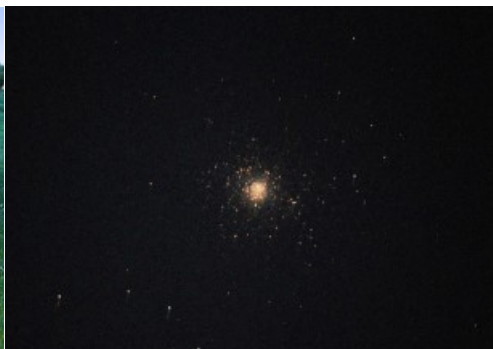
MEMBER OBSERVATIONS

GROUP GATHERS AT PAUL CASTLE APRIL 30



High, thin clouds that later covered the sky entirely meant that conditions were less than ideal, but this PAC group that gathered at Paul Castle Observatory on April 30 had a good time anyway. Shown are (from left) Ken Boquist, Rusty Case, Terry Dufek, Byron Davies (standing), Eva Davison, Chris Nordick, Ally Nordick, Ken Deckert and Alan Sheidler; John Douglas arrived after this photo was taken. Al did manage to capture these images of the M3 globular cluster (top left) and NGC4147.

PAC QUARTET GETS TOGETHER ON MAY 26



This quartet of PAC members (from left) Alan Sheidler, Steve Sinksen, Dale Hachtel and Wayland Bauer got together on May 26 at Paul Castle Observatory. Wayland set up his 6-inch Celestron SCT, Dale used the club's 5-inch Newtonian, Steve brought his 5-inch refractor on an altaz mount, and Al opened the observatory and operated the Celestron CPC 1100 HD. Sky conditions were excellent as the sun went down but clouds moved in by 10 p.m.; before conditions deteriorated, Wayland captured this very nice color image of M5.

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!

ASTRO-TRIVIA QUESTION

"(God) Which maketh Arcturus, Orion, and Pleiades, and the chambers (i.e. constellations) of the south." This verse, from the King James version of the Bible, is found in which book of the Old Testament?



**June
2021**

Faint fuzzies

One night in May, a comet named Palomar (actually known as C, for comet, 2020 T2 Palomar) was gliding near one of the most beautiful clusters of stars in the entire sky. It was parading about at about magnitude 11, which means that for my oldish eyes, it would be too faint to see.

In fact, just a few weeks ago I spotted a second comet, named ATLAS. That comet, at ninth magnitude, was so diffuse that I barely spotted it. So I was not going to try for this other comet.

However, this other comet was named Palomar after one of my favorite observatories! The mighty 200-inch telescope was opened in 1948, just a couple of weeks before I was born, and the big telescope has been sighting stars for more than 70 years.

In 1994, I was allowed to sit in the prime focus cage, that beautiful place where light from what the telescope is seeing comes to a perfect focus. So sighting a comet with that hallowed name would be special. The comet was discovered by Dmitry A. Duev on images taken using Palomar's Oschin Schmidt telescope last October. As the comet was brightening slowly, I learned that on Friday evening, May 14, the comet was planning to glide past Messier 3, one of the brightest globular star clusters in the whole sky.

That was just too much to resist. Clusters of stars are scattered all over the sky, and our own galaxy has more than a hundred of them. Globular clusters consist of hundreds of thousands of stars.

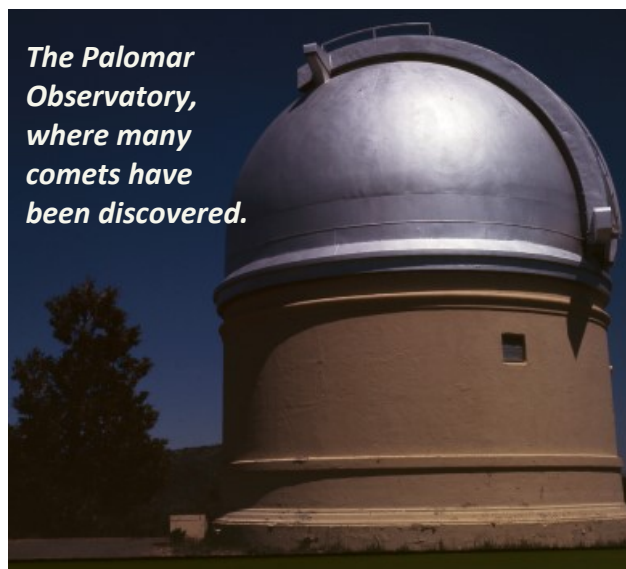
Messier 3 was discovered by Charles Messier, the famous Parisian discoverer of comets; it consists of some half a million stars and is more than 32,000 light years away. At about 11.4 billion years old, it is also one of the oldest things in the universe.

With the onset of darkness that Friday evening, I set up my telescope in my backyard observatory and pointed it toward Messier 3. The exquisite star cluster made its appearance. Then I nudged the telescope just a little bit to a nearby field of stars. Suddenly I spotted a faint fuzzy spot precisely where Comet Palomar was supposed to be.

As I looked around, a meteor scratched the sky to the north. It was a bright and unusual member of the May Ophiuchid meteor shower, a bonus on this unforgettable night.

Comet Palomar is the 219th comet I have seen during my lifetime. Most of these comets have also been faint, barely visible spots of haze. But some have been wondrous.

My first comet, Ikeya-Seki, was the great comet of 1965. Whether a comet is a faint fuzzy of a magnificent comet with a long tail, they are always welcome visitors to the Earth's region of the solar system, each one signing, as comet finder Leslie Peltier loved to write, "its sweeping flourish in the guest book of the Sun."



Astrophotography can be done with a smartphone

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 just have a 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 auto-focus, 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

A small, inexpensive tripod such as this one found at a dollar store can steady your phone, which is crucial to astrophotography.



These photos were taken by the author using an iPhone6; the photos of the crescent moon was taken with the phone propped on a car's roof rack, while the photo of the Moon's craters was taken through the eyepiece of a Celestron C8 telescope.

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!

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.

SUMMARY OF MAY MEETING

The latest monthly meeting of the Popular Astronomy Club, held May 10, featured a presentation by Dr. Terry Kucera, an astrophysicist with NASA's Goddard Space Flight Center in Greenbelt, Maryland. Dr. Kucera's presentation was titled "Views of the Sun and Solar Wind" and included information on the latest research about the Sun and its impact on Earth.

Nine people attended the meeting in-person at the Butterworth Center, with 23 sign-ins to Zoom. Attendees included guests from other astronomy clubs in the region, who were invited to participate virtually in the meeting.

A video of Dr. Kucera's presentation has been posted to YouTube and can be viewed via this link: <https://youtu.be/ofHU1oZ3AJ4>

Astronomical League Observing Programs

The Astronomical League provides many different Observing Programs. These Observing Programs are designed to provide a direction for your observations and to provide a goal. The Observing Programs have certificates and pins to recognize the observers' accomplishments and for demonstrating their observing skills with a variety of instruments and objects.



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ASTRO-TRIVIA ANSWER

*The verse is
found in the
ninth chapter
of the Book
of Job.*



UPCOMING EVENTS



Date: June 14, 2021

Event: Regular Meeting @ 7 p.m.

Location: Zoom / Butterworth Center

- **Program :** 'ALPO Overview'
- **by Matthew Will** (*see page 10*)

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

The June 14 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:**

- **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 19:** Outreach at Niabi Zoo; sunset
- **July 31:** Outreach at Silver Bell Hollow Alpaca Farm, Illinois City, 8 p.m.

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
MAR 2022	AVAILABLE	AVAILABLE	Business Meeting; Smorgasbord of Member Presentations