



# Reflections

The Newsletter of the Popular Astronomy Club

ESTABLISHED 1936



August 2021

## President's Corner: August 2021



**Alan Sheidler**

Welcome to the August 2021 edition of "Reflections", the universe's best astronomy newsletter. As I write this introduction, I am reminded that we have had

few opportunities for observing sessions. The weather has been either cloudy or rainy for much of the last couple weeks. As a result, I have spent more time catching up on my reading.

I subscribe to both Astronomy magazine and Sky & Telescope, both of which I have found particularly interesting. The August issues of both magazines have interesting articles which have animated my imagination and motivated me to discuss here.

Astronomy magazine's article, "Inside the Hunt for the Nearest Exoplanets" (p. 14), describes the Transiting Exoplanet Survey Satellite (TESS) and the search for Earthlike planets circling nearby stars. TESS identifies a planet candidate by watching for the dimming of a star when one of its planets transits (eclipses) the star.

The basic goal of TESS is to identify Earthlike planet candidates for further investigation. These planets are called TESS Objects of Interest (or TOI's). At the moment, there are nearly 3,000 TOI's which will be subjected to more detailed observation by both space-based and ground-based observatories.

TOI-700d is an Earth-sized planet orbiting a red dwarf star in the "Goldilocks zone" (not too hot, not too cold) for liquid water, potentially creating a haven for life. Another TESS-identified planet is LHS3844b, a super-Earth so close to its star that it orbits once every 11 hours! This planet's year is less than half an Earth day!

Current data shows this planet orbits only 930,000 kilometers from its star, meaning it is very hot and definitely not in the Goldilocks zone. It is also moving very fast. Doing a little math, the average orbital speed of this planet is 147 kilometers per second! For reference, this is five times as fast as Earth's orbital speed and three times that of Mercury. That's one fast planet (and hot)!

Both Astronomy magazine and Sky & Telescope have nice articles about Arecibo Observatory which I recommend you read. Arecibo contributed much to our understanding of pulsars. The dish of Arecibo's main telescope famously collapsed last year.

In 1968, Arecibo revealed a pulsar within the Crab Nebula (M1) having a period of just 33 milliseconds. This pulsar is rotating at the rate of 30 times a second (1800 rpm). For reference, household variety induction motors (like the fan motor in your furnace) operate at about 1,725 rpm. M1's pulsar is spinning faster than your fan motor!

A pulsar is a special kind of neutron star which emits beams of radiation from its magnetic poles. (A neutron star is the super dense core left over after a massive

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**PAC PICNIC  
AUGUST 14**

## AAS conducting satellite survey

The American Astronomical Society is conducting a survey on the impact that large satellite constellations are having on astronomy. Both professional and amateur astronomers are invited to respond to the survey.

The survey asks if your observing has been affected by the presence of large satellite constellations, such as StarLink and OneWeb, and if these satellites have negatively impacted your enjoyment of the night skies.

AAS will use the results of the survey to provide input and suggestions, and to raise concerns, on current and future agreements regarding the use of space by private companies.



Click on the link graphic to access the survey and provide your input.

### 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](mailto:levesque5562@att.net)

Thank you!

## 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?



## Popular Astronomy Club Officers



**PRESIDENT** - Alan Sheidler  
3528 56th Street Court, Moline, IL, 61265  
Phone: (309) 797-3120

**VICE PRESIDENT** - Dino Milani  
2317 29 1/2 Street, Rock Island, IL, 61201  
Phone: (309) 269-4735

**SECRETARY** - Paul Levesque  
5002 26th Avenue A Court, Moline, IL 61265  
Phone: (309) 236-1726

**TREASURER** - Dale Hachtel  
1617 Elm Shore Drive, Port Byron IL, 61275  
Phone: (614) 935-5748

**ALCOR** - Roy E. Gustafson  
11 Deer Run Road, Orion, IL, 61273  
Phone: (309) 526-3592

**DIRECTOR OF OBSERVATORIES** - Rusty Case  
2123 W. 16th Street, Davenport, IA, 52804  
Phone: (563) 349-2444

**PAST PRESIDENT** - Wayland Bauer  
3256 Pleasant Drive, Bettendorf, IA., 52722  
Phone: (563) 332-4032

**NEWSLETTER EDITOR** - Paul Levesque  
Email: [levesque5562@att.net](mailto:levesque5562@att.net)  
Phone: (309) 236-1726

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

## President's Corner: Arecibo observatory

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star undergoes a supernova explosion). Since the magnetic poles of a pulsar generally are not exactly aligned with its spin axis, the beams of radiation sweep through space similar to the beacon of a lighthouse. From Earth, the pulsar appears to pulsate on and off regularly.

The exact size and nature of a pulsar (and neutron stars) is still under investigation. Currently, we estimate them to be 2 to 3 times as massive as the Sun and yet only about the size of medium-sized city, perhaps 20 kilometers in diameter. This means these beasts are some of the densest objects known, second only to black holes.

If we assume the pulsar within the Crab Nebula is 20 kilometers in diameter and that it is spin-



*Before it collapsed last year, data collected by the telescope at Arecibo Observatory on Puerto Rico contributed much to our understanding of pulsars.*

ning at the rate of 1,800 revolutions per minute, this means its equatorial spin speed is 1,900 km per second! Can you wrap your mind around this pulsar? Super dense and super fast! Weird stuff indeed.

Give this some thought as you peruse the pages of yet another superb newsletter for your reading enjoyment. Thanks and keep looking up!

## QCAS, PV club to host meteor shower viewing

The Quad Cities Astronomical Society and the Pleasant Valley High School Astronomy Club will co-host a meteor shower viewing party at Pleasant Valley Junior High School, at 3501 Wisconsin Street in LeClaire, on Saturday, August 7.

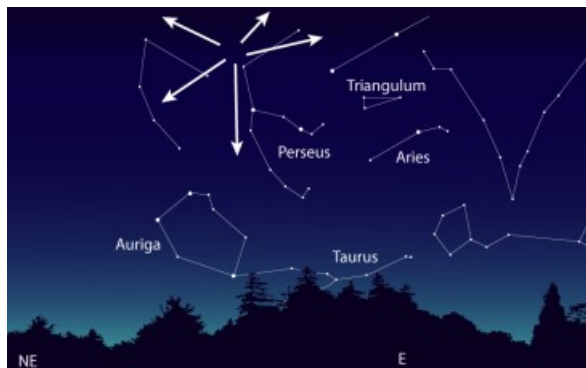
The viewing party will begin at dusk, approximately 8:30 p.m. The family-friendly event is free and open to the public.

Masks are optional at this outdoor event, but are encouraged in areas where social distancing cannot be maintained.

During the viewing party, "shooting stars" originating from the annual Perseid meteor shower should be visible. Though the number is impossible to predict, as many as 80 meteors or more per hour could flash across the sky at the peak, which usually occurs shortly after midnight.

Telescopes will be set up throughout the event, so those attending will also have an opportunity to use the telescopes to view objects such as the planets Jupiter and Saturn, double stars, star clusters, and nebulae. A member of the Quad Cities Astronomical Society will also be on hand to present information and answer questions about the meteor shower and visible constellations.

As part of the viewing party, QCAS will raffle off a telescope. Tickets are \$2 apiece and three for \$5, and you need not be present to win.



*This map shows the radiant of the Perseid meteor shower; during the peak, 80 meteors or more per hour could flash across the sky.*

Members of both QCAS and the Popular Astronomy Club are welcome at the event, and are invited to bring telescopes for viewing and provide other assistance as needed. To learn more, contact Jeff Struve via email at [pwrhsepro@aol.com](mailto:pwrhsepro@aol.com) or Dr. Robert Mitchell at [mitchellrobertc@sau.edu](mailto:mitchellrobertc@sau.edu).

Those who attend are advised to bring lawn chairs and insect repellent, and to dress for the weather. The event will be cancelled if the weather is cloudy or rainy.

Updates on the event will be posted to the Facebook page of the Quad Cities Astronomical Society, at <https://m.facebook.com/groups/875283012489267>



# Viewing the planets a treat in August

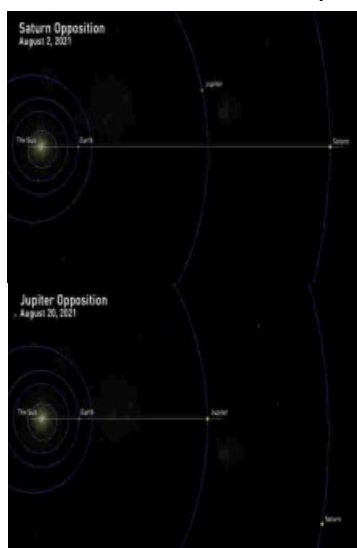
This August will be an excellent opportunity for anyone wanting to observe the planets, all eight of which will be visible sometime during the month.

In early August, just after sunset, look to the southwest and you will find Venus, Mercury and Mars. Venus, being very bright, is the easiest to spot, and can then be used as a guide to find Mars and Mercury, which will be very low in the twilight. You will need a bit of luck and a clear horizon to find them.

Jupiter, Saturn, Uranus and Neptune will also be visible during the month of August – though you will need a telescope to see Uranus and Neptune – making this month one of particular interest to those who love viewing planets.

My two favorite planets, Saturn and Jupiter, are the two largest in our Solar System, and both will reach what we call “opposition” this month. Only those planets which are further from the Sun than Earth can be in opposition: Mars, Jupiter, Saturn, Uranus and Neptune.

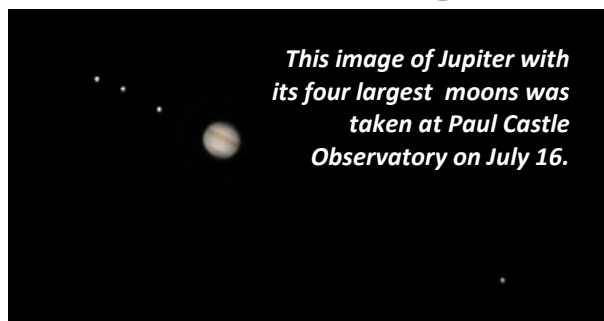
When a planet reaches opposition, it rises at sunset and is visible all night long, thus affording plenty of viewing time. At opposition, the Earth is exactly between the Sun and



the planet, meaning that the planet is as close to Earth as possible.

On August 2, Saturn will be 831 million miles from Earth. This is a

*The maps at left illustrate the planetary oppositions of Jupiter and Saturn that will occur in August.*



*This image of Jupiter with its four largest moons was taken at Paul Castle Observatory on July 16.*

great time to view Saturn in a telescope because it will appear larger in size and reveal more surface details. Jupiter will reach opposition on August 19-20, making its closest approach to Earth at 373 million miles.

While the night of opposition is technically the closest approach to Earth, any clear evening during the months of August and September will be good opportunities to view Jupiter and Saturn. Grab your telescope and go out an hour after sunset and look to the east. You should see two bright “stars” looming above the east / southeast horizon. As you look east, Jupiter will be a very bright “star” on your left and Saturn will be on your right, a little smaller and less bright than Jupiter.

Pointing a telescope at Jupiter and Saturn reveals their true nature. Jupiter, the largest planet in our Solar System, is 11 times larger in diameter than Earth and is 318 times as massive. Saturn is nearly ten times as big and 100 times as massive as Earth.

Both planets are huge, and Saturn’s splendid ring system makes it more immense. The visible rings are approximately 170,000 miles in diameter. If we could magically put Saturn in place of our Moon, it would fill our sky at night. Wouldn’t that be something?

Even though Saturn is very massive compared to Earth, it has a density similar to that of balsa wood. If you could find a big enough bathtub to put it in, Saturn would float on water. If you put Earth in the same bathtub,

*Continued on Page 5*

## ***August provides great views of the planets and Moon***

### ***Continued from Page 4***

it would sink to the bottom, because our home planet essentially is a chunk of rock with a heavy iron core.

Saturn and Jupiter are known as gas giants because they are mostly composed of a mixture of gasses. Along with being the largest and heaviest planets, they also have the fastest spin rates and so the shortest days, as measured by the time it takes to complete one rotation.

Jupiter's day is slightly less than 9 hours, 56 minutes. This means that it is rotating at 28,000 miles per hour at its equator, compared to about 1,000 miles per hour for Earth. This super-fast spin rate causes Jupiter to noticeably bulge at its equator.

As you marvel at Jupiter and Saturn in your telescope, look carefully at their surfaces. On Jupiter, you should be able to see two or more dark bands that run parallel to its equator. These bands are not surface markings, but darker cloud layers in the atmosphere.

Saturn also has cloud bands, but they are more subtle and subdued in appearance. When looking at these planets, all we actually see are atmospheric clouds which totally blanket their surfaces.

If you have a very good telescope, you might be able to see eddies, swirls and vortices in Jupiter's cloud bands. If you are lucky, you might also be able to see the giant cyclone known as the Red Spot. This cyclonic storm changes in size, shape and color over time and is a fascinating sight.

As you gaze at Jupiter through your telescope, allow your eye to stray slightly to either side of the great planet. Do you see any "stars" lined up nearby? If so, these are not stars, but the four largest moons of Jupiter: Callisto, Europa, Ganymede and Io. Sometimes you can see all four, but at other times,



***The landing site of Apollo 15 will be visible during the August full moon, 50 years after astronaut David Scott drove the 'dune buggy' over the lunar surface.***

one or two of them might be behind Jupiter or directly in front.

Saturn also has moons, the largest of which is appropriately called Titan. Titan is the second-largest natural satellite in the Solar System, behind only Ganymede, and is nearly 50 percent larger than our Moon. It can easily be seen in a small telescope.

Titan actually has a fairly thick atmosphere consisting of nitrogen, methane and other carbon-rich compounds. At minus 297 degrees Fahrenheit, Titan's surface temperature is much colder than Earth; like Earth, though, it has rain and lakes. Unlike Earth, the rain comes down not as water but liquid methane, which fills Titan's lakes. Cold shower anyone?

The Popular Astronomy Club will hold a public viewing session on the evening of Saturday, August 21 at Niabi Zoo. Weather permitting, we'll provide views of Jupiter, Saturn and other objects, including a nearly full Moon. As we train our telescopes on the Moon, consider that, 50 years ago this month, Apollo astronauts were driving the first "dune buggy" on the lunar surface.

Hope to see you August 21. Meanwhile, keep looking up!

**Alan Sheidler**

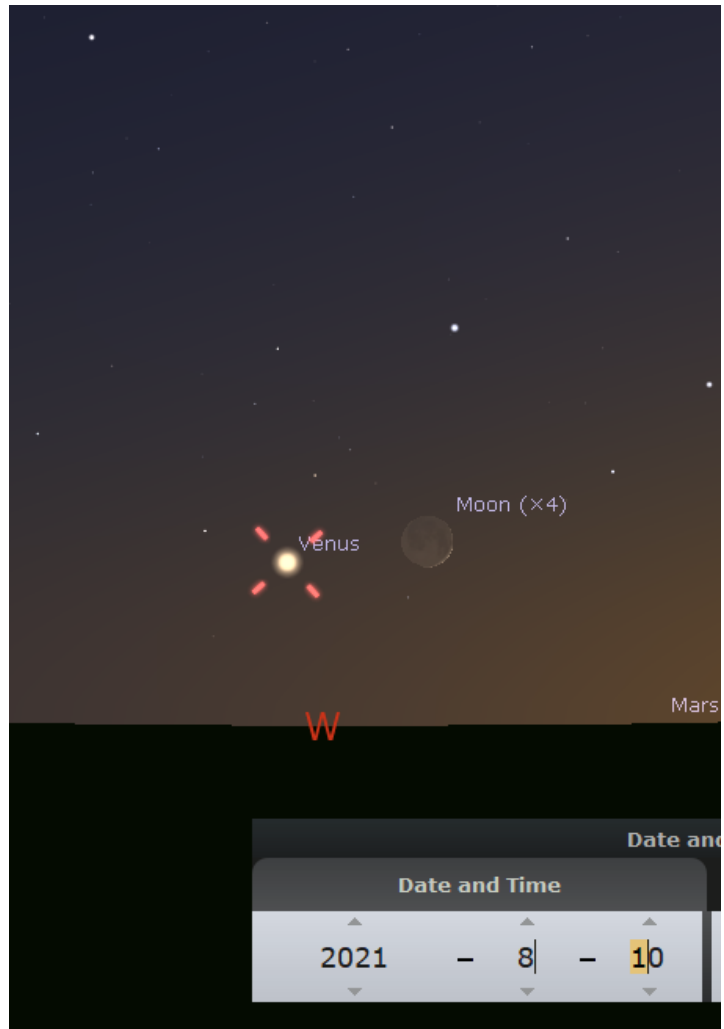
# The Planets in August 2021

## *Mercury – Venus – Mars*

**Mercury** starts off August low on the western horizon  $2^\circ$  above the horizon at 8 pm. It is magnitude  $-2.10$  and at superior conjunction. By the 20th, Mercury is mag  $.37$  and  $43'$  above the western horizon. It continues to dip in altitude the rest of the month until it is  $4^\circ 26'$  above the western horizon.

**Venus** starts off August at magnitude  $-3.91$  and  $8^\circ 7'$  off the west-southwestern horizon. You can catch a 2.5 day old moon nearby on the 20th at 9 pm.

**Mars** just straddles the western horizon at 9 pm. It is magnitude  $1.84$  and can be located just north of Venus. It slowly sinks into twilight glow the rest of the month.



# The Planets in August 2021

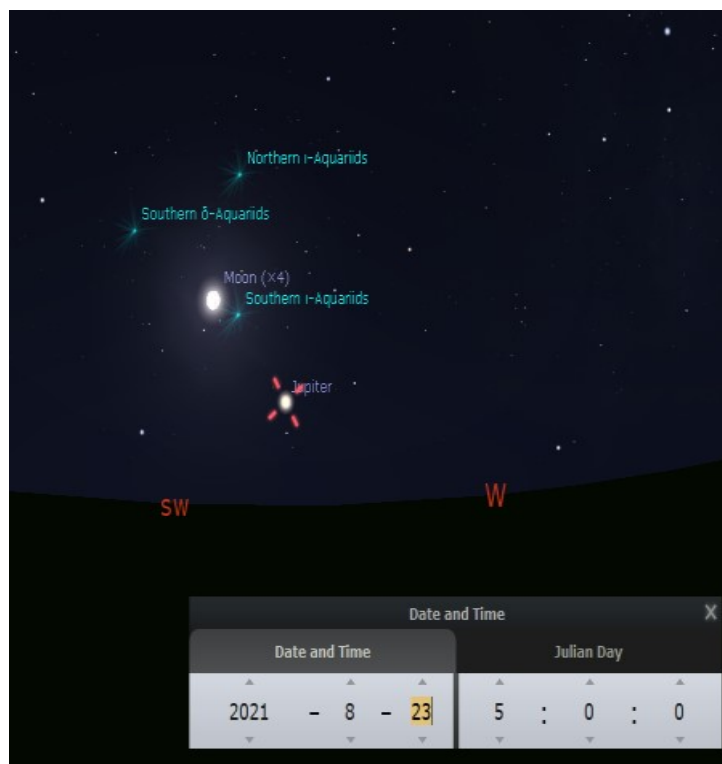
## *Jupiter, Saturn, Uranus and Neptune*

**Jupiter** starts off August in the southwestern sky at 5:30 am. It is magnitude -2.83 and 48' in diameter. Jupiter is at opposition on August 19th. You can catch Saturn to the southwest of Jupiter. The 15-day old Moon pass 16° north of Jupiter on the 23rd.

**Saturn** starts off August low in the southwestern horizon at 5 am. It is magnitude .18. It reaches opposition on August 2nd. The 11-day old Moon pass 11° south of Saturn on the 20th.

**Uranus** is high in the southeast on the 1st, 41° off the horizon at 4 a.m. It is magnitude 5.78. The Moon passes 2°48' to the south of the planet on the 1st and also on the 28th.

**Neptune** is high in the south on August 1st at 3 am. It is magnitude 7.84. The Moon passes 14° south on the 23rd.





## Spotlight : NGC 6820 / 6823

**NGC 6820** is a small reflection nebula near the open cluster NGC 6823 in Vulpecula. The reflection nebula and cluster are embedded in a large faint emission nebula called Sh 2-86. The whole area of nebulosity is often referred to as NGC 6820.

M27, the Dumbbell Nebula, is found three degrees to the east, and  $\alpha$  Vulpeculae three degrees to the west.

Open star cluster **NGC 6823** is about 50 light-years across and lies about 6,000 light-years away. The center of the cluster formed about two million years ago and is dominated in brightness by a host of bright young blue stars. Outer parts of the cluster contain even younger stars. It forms the core of the Vulpecula OB1.





# ASTRONOMY AND SPACE HISTORY – IT HAPPENED IN AUGUST

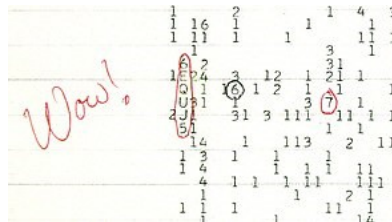
**August 4, 1181:** Astronomers in China and Japan report the first appearance of a supernova now known as SN1181. The supernova, which shone brightly in the constellation Cassiopeia and remained visible for 185 days, is one of only eight in the Milky Way observed with the naked eye in recorded history. The remnants of the exploding star that caused the supernova were once thought to be found in a pulsar known as 3C 58; however, it's now believed



that this pulsar is too old to be associated with SN1181, and an extremely hot object known as “Parker’s Star” is now seen as a more likely candidate.

**August 11, 1877:** Asaph Hall III peers through the 26-inch refracting telescope at the U.S. Naval Observatory in Washington, D.C., and spots what he believes to be a moon orbiting Mars. His observations are interrupted by foggy weather but, six days later, he verifies the discovery. On August 18, Hall spots Mars’ second moon. Hall’s work confirms speculation that Mars had at least one satellite and earns him numerous awards and honors. The moons are dubbed Phobos and Deimos, named for figures in Greek mythology who personified the fear felt in combat and so are associated with Mars, the god of war.

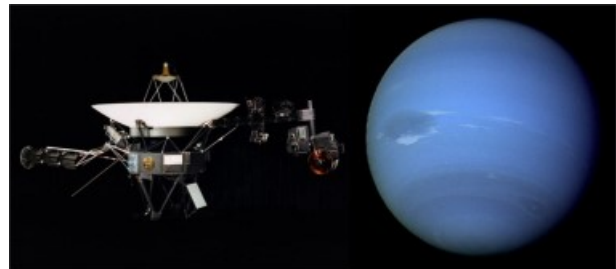
**August 15, 1977:** While analyzing data received by the “Big Ear” radio telescope at Ohio



State University as part of the Search for Extraterrestrial Life (SETI), astronomer Jerry Ehman notes a peculiar set of characters and writes “Wow!” on the margins of the printout. The so-called “Wow!” signal was much stronger than

average, seemed to come from a transient source, and has never been repeated. All of this is taken by some to mean that it may have originated from intelligent beings on a distant ex-traterrestrial planet.

**August 24, 1989:** The Popular Astronomy Club hosts a “Voyager Watch” public program at John Deere planetarium on the Augustana College campus. The program takes place as the Voyager II spacecraft, launched 22 years earlier, flies by the outermost planet, Neptune, and its main moon, Triton. Hundreds turn out for the program and look through telescopes set up by PAC members as well as the main telescope at Gamble Observatory. Though it is now about 12 billion miles from Earth in interstellar space, Voyager II remains in contact with NASA and may continue to send data until 2025, possibly longer.



**August 26, 2006:** The International Astronomical Union announces a change in the definition of what it means to be a planet, a decision that results in the demotion of Pluto to “dwarf planet” status and that reduces the number of major planets in the Solar System from nine down to eight. Pluto failed to meet one of the new criteria for remaining a planet in that it does not clear the neighborhood around its orbit; further, IAU astronomers noted that, if Pluto fit the definition of a planet, so did objects like the asteroid Ceres and perhaps dozens of others. The announcement triggered outrage among some, including schoolchildren who related to Pluto due to its small size, and the controversy over Pluto’s status continues to this day.

# MEMBER OBSERVATIONS



*Byron Davies celebrated Independence Day by taking these photos at Menke Observatory the night of July 3-4, using a Canon DSLR camera attached to an 8-inch Newtonian telescope. Shown above is the double open star cluster, NGC884 / NGC 869; to the left, from top to bottom, are the M17 Omega Nebula; the M13 globular cluster; the M51 spiral galaxy; and the M8 Lagoon Nebula.*



*Roy Gustafson used Stellina to capture this image of the Lagoon Nebula. Stellina is an observation station combining a camera and telescope that creates its own WiFi, aligns itself by getting GPS data from your smartphone, locates the item you select, tracks it, and then takes a photo every 10 seconds and stacks the images; it also has a built-in light pollution filter and dew heater. Roy describes his Stellina as "very slick and fun." See page 12 for more of Roy's Stellina images. Here's a link if you'd like to learn more: <https://vaonis.com/stellina>*



# MEMBER OBSERVATIONS



*PAC held a public viewing night July 17 at Niabi Zoo; shown in the group photo are members of the public along with club members Wayland Bauer, Rusty Case, Byron Davies, Terry Dufek, the Holt Family (Tim, Mary, Alex and Hugh), Dino Milani, Mel Schroeder, Al and Eric Sheidler, and Dave Smith. A number of objects were viewed and imaged that night; shown are an illustration of the moons of Saturn (far left, above), the M57 Ring Nebula (left, above), the M27 Dumbbell Nebula (far left, below) and the M13 Globular Cluster. As the sky darkened, the PAC-MO's telescope was used to survey the lunar landscape, with images of the Moon's craters, rilles, mountains and other features projected on a flat-screen monitor. Visitors had many questions, and Alex Holt took the lead in providing answers.*



Saturn and Retinue of Moons, 23-07, 17 July 2021, Niabi Zoo  
12" Meade LX200, FL = 1920mm, 5 sec exposure, ISO 3200



*Steve Sinksen (right) and Al Sheidler got together at Paul Castle Observatory on July 26, under a clear sky somewhat obscured by upper atmosphere smoke from Western fires. Al used his recently acquired ZWO atmospheric dispersion corrector to capture these images of Jupiter and Saturn, using a 2X Barlow lens on the 1100 CPC telescope; the images are stacked video frames taken with a Nikon D7500 camera processed with Auto-stakkert. Also shown is an image of T Draconis, a deep ruby red carbon star.*



*Roy Gustafson sent this image of the M20 trifold nebula on July 28, reporting that he captured it just before the clouds rolled in at about 11 p.m.*

# MEMBER OBSERVATIONS



*Here are more images sent by Roy Gustafson taken with the Stellina (shown above). All were taken from Roy's home in Orion except the M27 Dumbbell Nebula image, taken at Lake George, Minnesota. A guide to the photos and the technical specifications follows (no info on the Moon photo):*

*M27 (Dumbbell Nebula), 67 stacked images, 11 minutes 10 seconds observation time*

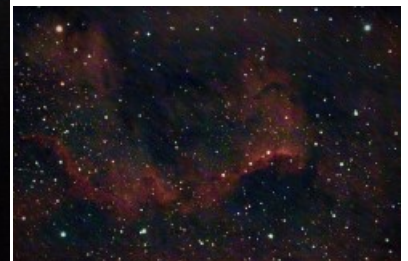
*NGC6960 (Veil Nebula), 133 stacked images, 22 minutes 10 seconds*

*M51 (Whirlpool Galaxy), 109 stacked images, 18 minutes 10 seconds,*

*NGC7000 (North American Nebula), 355 stacked images, 59 minutes 10 seconds*

*M16 (Eagle Nebula), 202 stacked images, 02 July, 33 minutes 40 seconds*

*M8 (Lagoon Nebula), 210 stacked images, 26 July, 35 minutes*





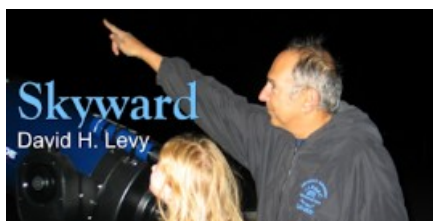
# MEMBER OBSERVATIONS



*An observing session was held at Paul Castle Observatory after the sun went down on July 6. In the photo are (from left) Al Sheidler, Chad Potter and Dale Hachtel; John Douglas was also there but didn't make the photo. Conditions weren't the best due to haze but were good enough to capture these images of (top, from left) the M22 Sagittarius Cluster and M69 globular cluster; (bottom, from left) the M51 Whirlpool Galaxy, NGC6440 cluster and NGC6544 Starfish Cluster. The equipment used included Chad's Nikon D110 SLR camera, Al's Nikon D7500 camera, and the club's R2 Revolution Imager.*



*Along with the Jupiter photo shown on page 4, here are some images captured at Paul Castle Observatory on July 16. Shown at left (from top) are the NGC6309 Box Nebula and three carbon stars: RV Cygni, V Cygni, and V460 Cygni.*



**August  
2021**

## **Rebirth of an observatory**

“How would you like to go to prison?” was one of the first things that Frank Lopez asked me. My stunned expression prompted Frank to clarify: “The Federal prison off Wilmot Road has an astronomy club.” That was enough: We enjoyed two wonderful evenings there, and even showed Orion to the group using one of my favorite telescopes.

I dealt with Frank once again in the last few months, as our Jarnac Observatory’s Shaar house, the major observatory building in my back yard, threatened to collapse earlier this year. The Shaar name is from the Hebrew word for “gate” or “opening,” and I use the name because the structure resembles a miniature version of our Shaar Hashomayim synagogue in Montreal. The observatory is as much a temple for me as the Shaar was.

Frank brings a lifetime of experience to the observatories he builds and repairs. He came up with a plan that would restore my building with a brand new sliding roof. Working occasionally with assistants but mostly alone, the construction took several months, virtually all last winter and spring. (Actually, my sliding roof is the entire top half of the building.)

During this time, I learned a lot about Frank’s work ethic. He does not rush things. He takes his time and works steadily for three days a week with construction and maintenance; the rest of his time he manages his “Stellar Vision” astronomy store in Tucson.

I learned that he built most of the observatory complex for Dr. Tim Hunter’s Grasslands observatory southeast of Tucson near Sonoita, and a large observatory structure for David Rossetter’s 25-inch Dobsonian northeast of the city center.

Throughout most of southern Arizona, Frank’s Stellar Vision observatory business is really the best game in town. He knows what he is doing and brings his decades of experience to each project. Frank builds observatories with energy, strength, and even humor.

These structures do a lot more than house telescopes over many years. They store the memories of a thousand and one nights under the stars. They offer stories of terrible nights when a telescope fell off its mount, of only slightly less frustrating nights when cameras failed to work. They protect their telescopes from the winds and the rains that Arizona occasionally goes through. But mostly, they protect memories of precious nights under the stars.

Finally, I like to imagine that long after I have closed up and gone to bed, the telescopes talk to one another about what they have seen, and what they have yet to see.

One recent evening, after a big monsoon storm and after the Shaar was finally completed, I went out and discovered that the telescopes inside were safe and dry. On a drier night I went out, opened its big roof, and stared at the stars. I felt as though I was starting my love of the night sky all over again.

***The rebuilt  
Shaar House  
at the Jarnac  
Observatory.***



# Cornering the Great Square of Pegasus

The Summer Triangle may be the most famous seasonal star pattern, but during early August evenings another geometrically-themed asterism rises: The Great Square of Pegasus. This asterism's name is a bit misleading; while three of its stars - Scheat, Markab, and Algenib - are indeed found in the constellation of the winged horse Pegasus, its fourth star, Alpheratz, is the brightest star in the constellation Andromeda.

August evenings are an excellent time to look for the Great Square, as it will be rising in the east after sunset. If not obvious at first, wait for this star pattern to rise a bit above the murky air, and remember that, depending on your point of view, it may appear more like a diamond than a square.

Look for it below the Summer Triangle, or to the southeast of nearby Cassiopeia at this time. As the Great Square rises in prominence during autumn evenings, it becomes a handy guidepost to finding more constellations, including some of the dimmer members of the Zodiac: Aries, Pisces, Aquarius, and Capricornus.

Like the Summer Triangle, the Great Square of Pegasus is also huge, but Pegasus itself is even larger; out of the 88 constellations, Pegasus is 7th in size, and feels even larger as the stars in its neighboring constellations are much dimmer.

There are many notable deep-sky objects found within the stars of Pegasus, ranging from those that are easily spotted to expert-level targets. This makes it a great constellation to revisit as your observing skills improve.



***Stephan's Quintet, one of the most famous deep-sky objects, was the first galaxy group discovered. The five galaxies in the group will someday merge into one super-galaxy.***

Notable objects include the densely-packed stars of globular cluster M15, a great first target. The potential "Milky Way look-alike" galaxy NGC 7331 is a fun target for more advanced observers, and expert observers can hop nearby to try to tease out the much dimmer interacting galaxies of Stephan's Quintet.

A fascinating (but extremely difficult to observe) object is a gravitationally-lensed quasar famously known as the Einstein Cross. Pegasus has quite a storied history in the field of exoplanet research: 51 Pegasi was the first Sun-like star discovered to be host to a planet outside our solar system, now officially named Dimidium.

While observing Pegasus and its surroundings, keep your eyes relaxed and ready to catch some Perseids, too! August 2021 promises an excellent showing of this annual meteor shower.

***Continued on Page 16***



***While the stars of the Great Square of Pegasus are not as bright as those of the Summer Triangle, they still stand out compared to their neighbors. Note that the brightness of the stars near the horizon is exaggerated in this picture.***



## Great Square of Pegasus contains wonders

*Continued from Page 16*

The crescent Moon sets early on the evening of the shower's peak on August 11-12, but you can spot stray Perseids most of the month.

If you trace the path of these meteors, you'll find they originate from one point in Perseus - their radiant. Giant planets Jupiter and Saturn will be up all evening as well. Look south - they easily stand out as the brightest objects in the faint constellations Aquarius and Capricornus.

Pegasus truly holds some fantastic astronomical treasures! Continue your exploration of the stars of Pegasus and beyond with NASA at [nasa.gov](http://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](http://nightsky.jpl.nasa.gov) to learn more.*

### **TELESCOPE FOR SALE: CELESTRON 150 mm (6") APERTURE; 750 MM FOCAL LENGTH; F/5; NEWTONIAN TELESCOPE and EXPLORER SCIENTIFIC TWILIGHT 1 ALT-AZIMUTH TRIPOD**

Included with the scope will be an Orion 8 X 40 (8X magnification & 40mm aperture), cross hair finder scope, an Orion 25mm eyepiece (provides 30X magnification), and an Orion 10mm eyepiece (provides 75X magnification). The scope's length is 27" and weight is 10 pounds.

The tripod has geared slow motion with flexible cable controls for fine altitude and azimuth adjustments; an adjustable angle head; uses Vixen style dovetail bracket; measures 52" from floor to dovetail bracket when legs are fully extended. Weight is approximately 16 pounds.

Asking \$300. Contact Wayland Bauer: [bauerwp@gmail.com](mailto:bauerwp@gmail.com) / (563) 332-4032



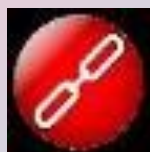
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# UPCOMING EVENTS



**Date:** August 14, 2021

**Event:** ANNUAL PAC PICNIC

**Location:** Paul Castle Observatory

- NO MONTHLY MEETING
- AT BUTTERWORTH CENTER

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

You are all invited to the annual Popular Astronomy Club picnic at Paul Castle Observatory on Saturday, August 14. The festivities begin at 6:30 p.m. The grille will be fired up, so bring something to put on it along with a dish to pass and maybe your favorite dessert as well. Thanks to Wayland and Ann Bauer for organizing this event; send a message to [bauerwp@gmail.com](mailto:bauerwp@gmail.com) if you have any questions.

Other upcoming events:

- August 7: QCAS Meteor Shower Viewing Party, Pleasant Valley Junior High School
- August 14: St. Ambrose Public Outreach, Menke Observatory
- August 21: PAC Public Outreach, Niabi Zoo
- August 28: QCAS Public Outreach, Menke Observatory
- September 4-6: Eastern Iowa Star Party
- September 4-6

MONTH	NEWSPAPER ARTICLES	CONSTELLATION REPORT	PROGRAM
SEPT 2021	Jim Rutenbeck	AVAILABLE	Business Meeting; Smorgasbord of Member Presentations
OCT 2021	Paul Levesque	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
APR 2022	AVAILABLE	AVAILABLE	Presentation: "Fantastic Space Discoveries: Theories of Solar System Formation" by Jim Kovac, Chicago Society for Space Studies