Reflections

The Newsletter of the Popular Astronomy Club

ESTABLISHED 1936

Affiliated with

September 2021

President's Corner: September 2021

Alan Sheidler

Welcome to the September issue of Reflections, your club's newsletter. It's hard to believe we are entering Fall already.

A lot has happened in the last couple of years. COVID 19 has figured prominently in the headlines and the Delta variant threatens a resurgence of new infections in the unvaccinated. Thankfully, society has mostly learned how to live with the virus and so has PAC.

2021 has been a very good year for PAC's public outreach programs. As we move now into the Fall, I am hopeful the pandemic doesn't force the cancelation of these club activities. Whatever happens, we amateur astronomers are an optimistic and resilient group, so we will adapt and respond accordingly.

Your club will celebrate its 85th birthday this October, so we have a lot to be thankful for. To mark this significant milestone, PAC's 85th anniversary banquet will be Saturday evening, October 23. Assuming COVID 19 does not force restaurant closures, we expect to have an in-person banquet meal at the Riverfront Grille in Rock Island.

Our speaker for the event is Dr. Russet McMillan, who will give us a talk via Zoom about her work at Apache Point Observatory.

The Apache Point telescope is equipped with a powerful laser which Dr. McMillan uses to zap retro-reflectors left on the surface of the moon by Apollo astronauts. After the laser beam bounces off of a retro-reflector, with a little luck, a few photons of the laser light ends up being captured back at the telescope 2.5 seconds later. You won't want to miss this opportunity to learn about how these laser-ranging experiments are contributing to our knowledge of the Earth-Moon system.

By the way, of all the equipment left on the surface of the moon by the Apollo astronauts five decades ago and more, the retro-reflectors are the only ones still in active use. I am very much looking forward to this talk. Be sure to send in your RSVP for this year's 85th PAC Banquet. You can find it here in the newsletter. Don't miss this exciting talk.

I also want to remind you about our September 13 PAC business meeting. This is planned to be another hybrid meeting with both Zoom and in-person components. There will be a short business meeting, followed by a Smorgasbord of short presentations. This is your chance to do a short talk or presentation on your favorite astronomy-related topic.

Your presentation can be about hardware, observations, science, space, astrophotography, constellation report, or any other topic related in some way to astronomy. Your vice-president Dino Milani is coordinating these talks. So please contact him to get on the docket. I don't want to

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Due to technical issues, publication of this issue of "Reflections" was delayed.

President's Corner

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miss this one either.

Your club also has leadership opportunities for you. This December, the terms for your club officers all come to an end. This means there is a chance for you to run for an office.

I urge you all to seriously consider this. As an officer, you can guide the direction of the club and make a lasting mark in field of amateur astronomy. Not only that, but you can also learn leadership skills.

If you have not been an officer before it may sound daunting, but I assure you it isn't. It can be fun and rewarding in ways you may not imagine until you try it. Why not "throw your hat in the ring" this December and run for an office?

Keep looking up! AL

SUBMISSIONS WELCOME!

This is YOUR newsletter, so we want to hear from you! If you have an article or photos to submit, or other items that might be 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 (attachments) rather than embedded in emails. Send to: 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

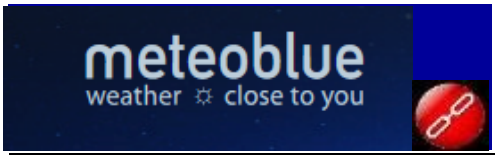
NCRAL SPRING Seasonal Messier List

NCRAL SUMMER Seasonal Messier List

NCRAL AUTUMN Seasonal Messier List

NCRAL WINTER Seasonal Messier List

HOW'S THE WEATHER?



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September

A great month for viewing the night sky

September is a great time of the year to view the night sky. During this month that brings the end of summer and start of fall, it becomes dark earlier in the evening and temperatures are generally mild.

At the beginning of September, the sun sets at about 7:30 p.m. By the end of the month, sunset occurs at about 6:45 p.m.

Shortly after sunset this September, on a clear evening, look to the west. You will see a bright object, one that rates as the second-brightest in the night sky behind only the moon. This is the planet Venus.

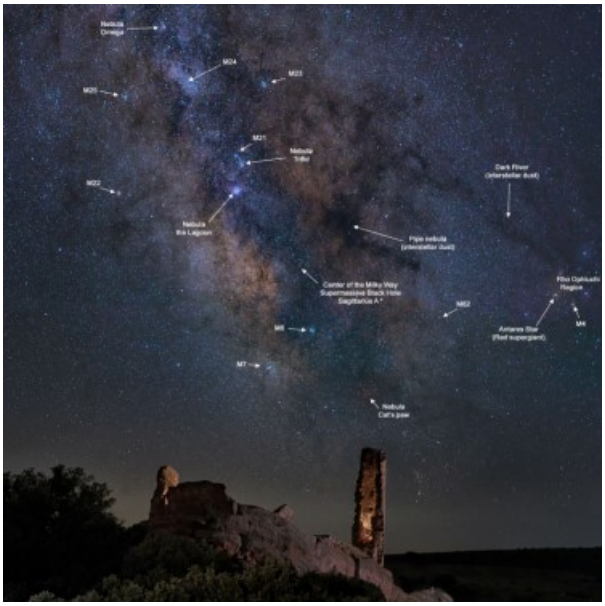
A half-hour after sunset, look to the southeast. You should see two bright "stars," objects that are actually planets. The one to the left, and the brighter of the two, is the planet Jupiter. The one to the right is the planet Saturn.

These are the largest planets in our Solar System. If you have a telescope in a dark place with clear skies, you may see rings around Saturn and as many as four little dots of light in a line around Jupiter. These dots are the four brightest of Jupiter's many moons.

September 2021 provides some of the best views we'll have of Saturn and Jupiter because they recently have been in opposition. This means that they are closest to the Earth and also visible most of the night.

Depending on the day of the month, our moon may be visible. The moon rotates around the Earth in a little under a month (the word "month" is derived from moon) and so goes through four different phases.

September 6 brings the new moon, which means that the moon is between the Earth and the sun and therefore not visible on this night. By September 13, the moon has moved to a position that we call the first quarter, with one half of its surface lit and visible in the southwest until it sets at about 11:30 p.m.



This photo of the Milky Way, showing the location of various objects, was taken in Spain on July 10. The Milky Way remains visible through September and is best viewed in a dark location with a clear horizon.

By September 21, the moon is full, which means it is directly opposite the sun in its orbit. It will rise in the east at about the same time that the sun sets in the west and be visible nearly all night long, setting in the west about the time that the sun rises in the east the next morning.

By September 28, the moon will be at third quarter, appearing as a half-lit object rising in the east at about 11:30 p.m. and moving to nearly halfway up the sky by dawn.

Along with the moon and planets, there are many stars in the sky, but some can be difficult to see from the city because of bright artificial lights. If you can travel to a location

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Alpaca farm becomes Al-PAC-a farm

The Popular Astronomy Club held a public observing session at the Silver Bell Hollow Alpaca Farm near Illinois City the night of July 31. The session attracted about 50 visitors (all human – alpacas are apparently uninterested in astronomy); PAC members present included Rusty Case, Byron and Sharon Davies. Dale and Joanne Hachtel, Al Sheidler, Eric Sheidler, and Wayland and Anne Bauer, Viewing conditions were far from perfect due to intermittent clouds and smoke and haze from western wildfires. Nevertheless, a number of objects were successfully viewed and photographed, including the Dumbbell Nebula and the M13 cluster in Hercules.

September: A good month to view the Milky Way

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away from city lights, you can see much more in the sky, especially around the time of the new moon when moonlight doesn't wash out dimmer stars.

If you are in a dark location, look to the south and overhead. You should see white "cloud of light." This is the densest part of our galaxy, the Milky Way. Our sun is just one of more than a billion stars which call the Milky Way home.

It is a joy to look at all these stars so far away that blend together to look like clouds in the night. With binoculars or a telescope, more stars and other objects can be resolved.

During September, you are welcome to attend two public viewing nights held by local astronomy clubs. On Saturday, September 18, the Popular Astronomy Club will hold an observing session at Niabi Zoo in Coal Valley.

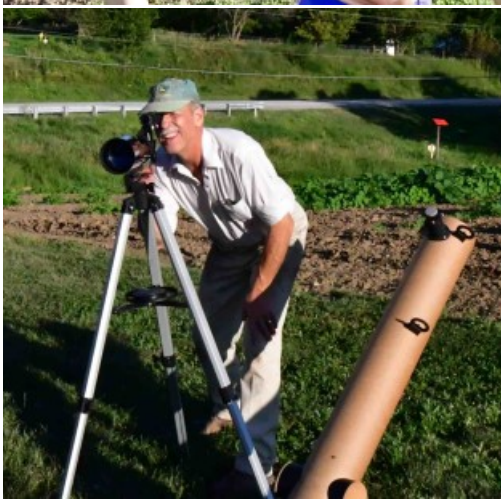
The following Saturday, September 25, the Quad Cities Astronomical Society will offer a public viewing session at the Wapsi River Environmental Education Center, located north of Dixon, Iowa.

Both events will begin at about sunset, and are free and open to everyone. Please join us so you can learn more about the wonders of the night sky in September, and the year round.

Jim Rutenbeck

Clear skies and camaraderie highlight annual PAC picnic

The annual PAC picnic was celebrated at Paul Castle Observatory on August 14, a Saturday evening that featured clear skies and plenty of camaraderie. About 30 members and guests were present for the event, which featured food and fun. The grille stayed hot and full and there were plenty of sweets for dessert, including a cake honoring the 54th wedding anniversary of Wayland and Ann Bauer. PAC members also offered best wishes to Ally Nordick as heads off to college, and thanks as always to the Nordick family. After sunset, telescopes were set up and the observatory was opened. No magnification was needed to see several bright "shooting stars" from the Perseid meteor shower.

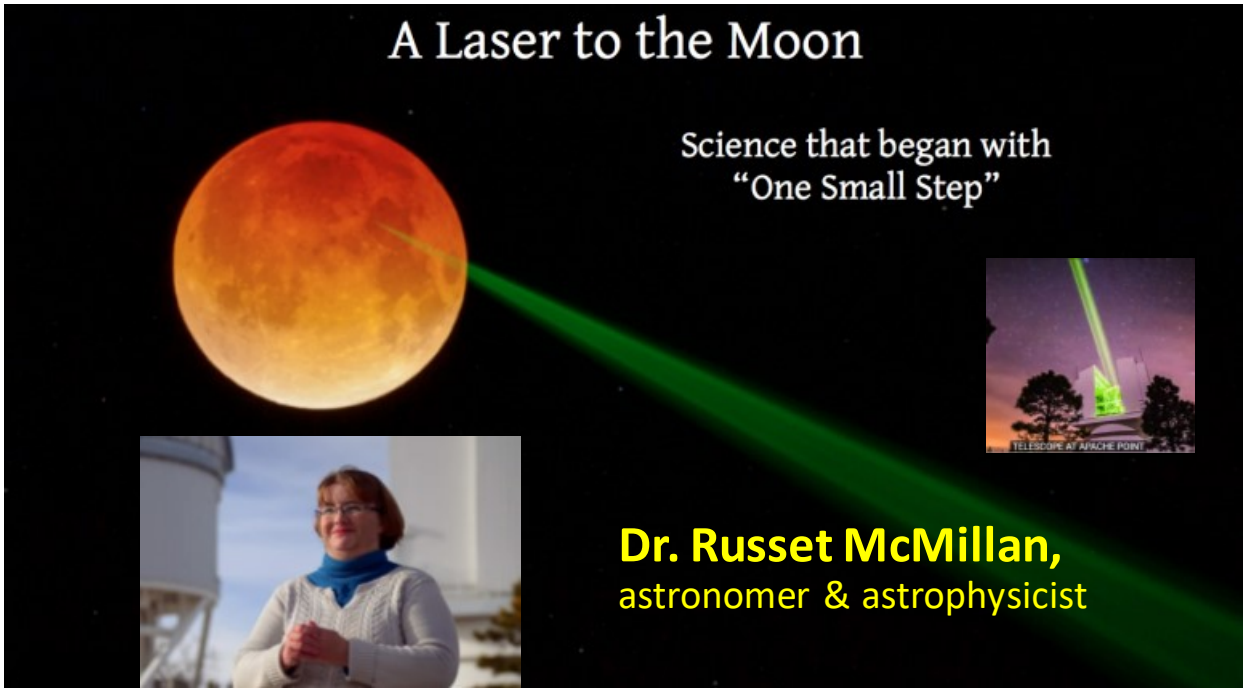


The Popular Astronomy Club will celebrate its 85th anniversary at its annual banquet, which takes place on Saturday, October 23, at the Riverfront Grille, 4619 34th Street in Rock Island.

The event will begin with a social time at 5:30 p.m., followed by a buffet dinner at 6 p.m. At about 7 p.m., guest speaker Dr. Russett McMillan of the Apache Point Observatory in New Mexico will give a virtual presentation titled "A Laser to the Moon."

Following the presentation at about 8 p.m., awards and door prizes will be presented.

The cost of the banquet is $25 for adults and $12.50 for children under the age of 12. RSVPs are requested by October 9 and you can reserve your spot by using the form on the bottom of this page. NOTE: Refunds will be offered if the restaurant must close due to COVID-19.



RSVP
kindly respond on or before
October 9 th, 2021

Cost per adult: $25 Children: $12.50

Full buffet dinner and cash bar

(include with RSVP, checks made out to the Popular Astronomy Club). Mail to Dale Hachtel, 1617 Elm Shore Drive, Port Byron, IL 61275 (dale_hachtel@msn.com)

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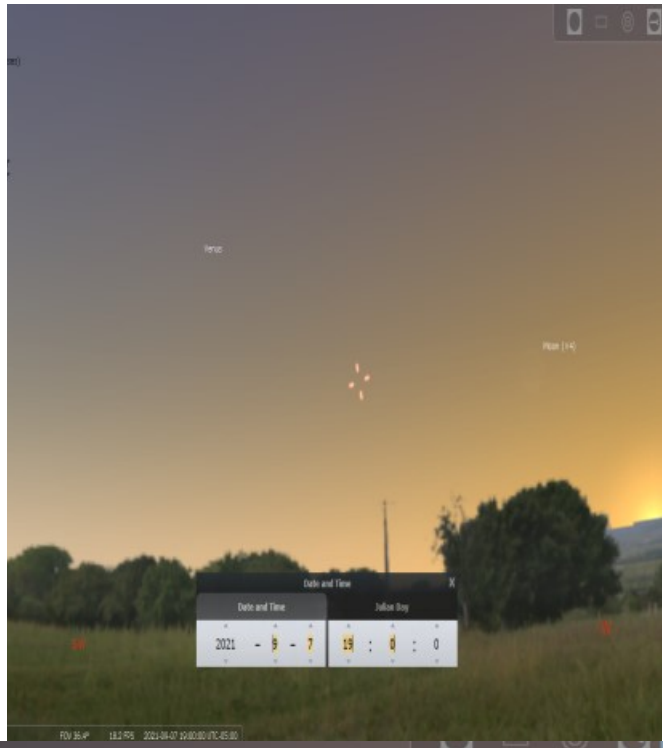
The Planets in September 2021

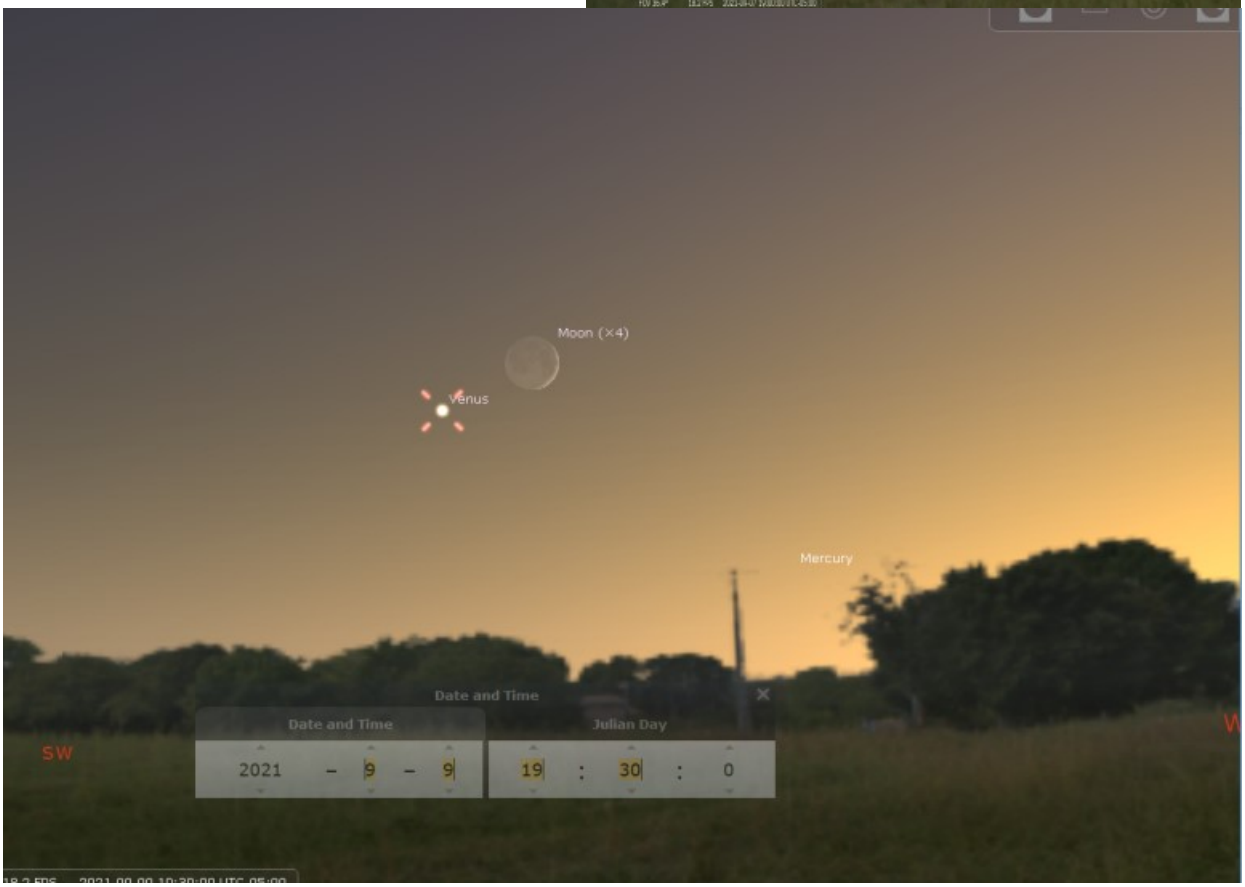
Mercury – Venus – Mars



Mercury is in the western sky on September 1st. It is magnitude 0.3 and low in the western southwest sky at 7 p.m. On the 13th, Mercury reaches its greatest elongation east. So look for it in the same general location at 6:30 pm. On the 7th look for the moon north of the planet Venus.

Venus on September 1st blazes away at magnitude -4.04 low in the southwest sky at 7 pm. On the 9th, the Moon passes close by.

Mars is too close to the Sun this month but the red planet reaches apogee on the 20th.



The Planets in September 2021

Jupiter, Saturn, Uranus and Neptune

Jupiter continues to blaze away high in the southeast on September 1st at magnitude –2.85 at 7 p.m. Catch the 12.9-day old moon south of it on the 18th. Saturn shines very bright just to the west of the giant of the solar system.

Saturn makes a stunning companion to Jupiter low in the southern sky on September 1st at 7p.m. It is a stunning magnitude .64. On the 16th, there is a close approach of a 10.8-day old moon.

Uranus on September 1st is moderately high in the southern sky at 5 am. It shines at magnitude 5.70. It makes a close approach to the moon on September 24th.

Neptune is low in the southeast on September 1st. Neptune trails Jupiter's rising The blue giant reaches opposition on the 14th.

Spotlight: NGC 6811

NGC 6811 is an open cluster in the constellation of Cygnus near Lyra. It has an angular size half that of the full Moon and includes about 1,000 stars of roughly similar magnitude. It has also been called "The Hole in the Cluster" because of its dark center.

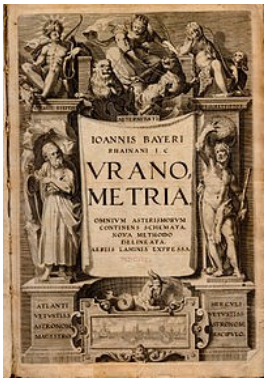
NGC 6811 lies far away from the galactic plane, a feature it shares with many other old open clusters It is 1107 ± 90 parsecs (about 3,285 light years) distant and approximately 4-6 parsecs (14–20 light years) in diameter with a total luminosity of 2,100 suns. Approximately 1.00 ± 0.17 billion years old, the cluster probably contained some 6,000 stars at birth, but gravitational interactions and stellar evolution have since reduced the number substantially. A recent study reported 377 confirmed member stars, with spectral types ranging from mid-F to early K, and surface temperatures relatively similar to the sun. The same study argued that the original cluster population likely included 8 O-type stars and 125 B-type stars, but all have evolved off the main sequence and are undetectable. Sixteen stars have been observed to vary in brightness, 12 of which are Delta Scuti variables. The cluster's Trumpler classification is III 1r—it is "a rich cluster with equally bright stars with no noticeable central concentration." The stars do, however, have an unusual (if not concentrated) distribution, with an apparent stellar corona surrounding the core, leaving the impression of a hole.

NGC 6811 was first observed by John Herschel in 1829 and was added to his *General Catalogue of Nebulae and Clusters* in 1864. The cluster has been the subject of study by the Kepler mission, with the aim of characterizing its stars' rotation rate, age, and distance to help the hunt for exoplanets.

NGC 6811 is best observed from Earth in the Northern Hemisphere in summer. In these conditions, it lies close to the zenith during the night, northeast of Delta Cygni. It is considered an aesthetically pleasant object for amateur astronomers, even if the brightest members are just 10th magnitude objects. It appears as a hazy patch in 10x binoculars, but it is best seen at around 70x with a moderate-aperture telescope. It has been described by amateur astronomers as a "smoke ring of stars" or "a jeweled mask a woman might wear at a masquerade ball."

Two planets (Kepler 66b and Kepler 67b), orbiting Sun-like stars in the NGC 6811 cluster, have been discovered by the Kepler mission using the transit method. Both planets are smaller than Neptune and are both the first sub-Jupiter planets and the first transiting planets discovered orbiting stars within an open cluster. Given that the age and distance of the cluster have been accurately measured, the two planets are among the few of which age and distance are accurately known. This finding suggests that the frequency of planets in clusters is similar to that in stars not belonging to clusters or associations and that planets can form and survive in environments more crowded and violent than the one of our own Sun.

ASTRONOMY AND SPACE HISTORY – IT HAPPENED IN SEPTEMBER



September 1603: Johann Bayer, a lawyer and amateur astronomer in Augsburg, Germany, publishes "Uranometria," a work named for the Greek muse of the heavens and informatively subtitled "containing charts of all the constellations, drawn by a new method and engraved on copper plates." The book contained 51 star charts, the first 48 of which were of the Ptolemaic constellations, followed by a chart showing 12 recently discovered southern constellations and two planispheres illustrating overviews of the night skies in the northern and summer hemispheres. Each plate included a grid accurately determining the positions of stars within fractions of degrees; the positions were based on a star catalog previously published by Tycho Brahe.

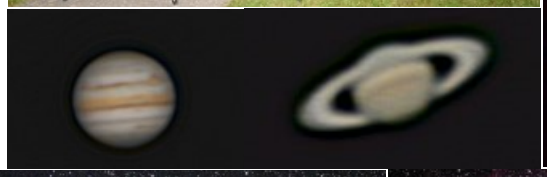
September 7, 1914: James Van Allen is born on a small farm outside Mount Pleasant, Iowa. After being rejected for admission by the U.S. Naval Academy, Van Allen earned degrees in physics from Iowa Wesleyan College and the University of Iowa. He served with the Navy in the South Pacific during World War II and later returned as a professor to the University of Iowa, where he became head of the department of physics and astronomy. Van Allen is best known for the discovery of radiation belts around the Earth that now bear his name; Van Allen detected the belts in 1958 using scientific instruments aboard early American satellites. He was among the U.S. scientists cited as "Person of the Year" by Time Magazine in 1960. Van Allen died in Iowa City in 2006.

September 8, 1966: The television series "Star Trek" debuts on NBC; the network aired the series, which featured one of TV's first multiracial casts, for three seasons before canceling it due to low ratings. But this was far from the end for "Star Trek," a cultural phenomenon which lives on and has generated billions of dollars in revenue. To date, seven follow-up TV series, several animated series, and 13 feature films based on "Star Trek" have been produced and released, not to mention numerous comic books, novels, exhibits, theme park attractions, works of fan fiction, etc. Millions of "Trekkies" worldwide flock to annual conventions and other events, including "Trekfest" in Riverside, Iowa, where Captain James T. Kirk was (or will be) born in the 23rd century.

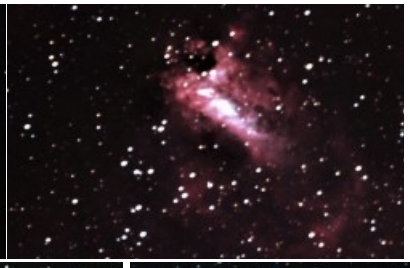
September 11, 1962: NASA introduces Astronaut Training Group 2, a prestigious group that came after the "Mercury Seven" and become known as the "Next Nine." Eight of the nine would ultimately fly on Gemini, Apollo and Skylab missions, including Frank Borman, who piloted Apollo 8 on the first flight that left Earth orbit and went around the moon, and Neil Armstrong, the first man to walk on the moon. Civilian test pilot Elliot See was the only one of the nine who never made a space flight; he was scheduled for launch aboard Gemini 9, but he and crewmate Charles Bassett died on February 28, 1966, when a T-38 trainer jet he was piloting crashed in St. Louis.

September 23, 1846: At the Berlin Observatory, German astronomer Johan Gottfried Galle becomes the first person to knowingly observe Neptune through a telescope, verifying work done by French astronomer Urbain Jean Joseph LeVerrier and British astronomer John Couch Adams. All three are credited with discovering the planet now classified as the outermost in our Solar System. Galle found Neptune by using mathematical calculations of the orbit of Uranus derived independently by LeVerrier and Adams, who both concluded that deviations in Uranus' orbit were caused by the gravitational attraction of another, more distant planet.

MEMBER OBSERVATIONS



Rusty Case, Byron Davies and Al Sheidler met up at Menke Observatory on August 8; Al brought his Meade 10-inch LX200 while Rusty and Byron brought their 8-inch reflectors, and they came away with these images. Al took the Jupiter and Saturn images as one-minute video clips and then stacked in Autostakkert; the LX200 was also used to capture the Garnet Star (top) and double star Xi Booti. Byron came away with the images of (from left, bottom) the Crescent Nebula, North American Nebula and Fireworks Galaxy.



Byron Davies also sent these very fine images which he took in August; shown are (upper, left and right) the star Antares and the Eagle Nebula; and (lower, left to right) the Omega Nebula, Trifid Nebula and Lagoon Nebula.

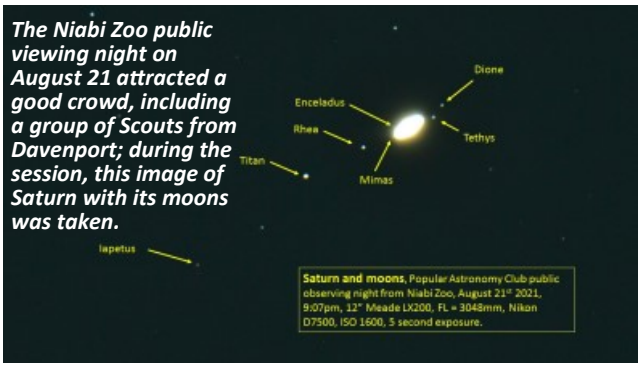
MEMBER OBSERVATIONS

Wayland Bauer, Dale Hachtel and Al Sheidler spent the evening of August 3 at Paul Castle Observatory, where Dale used a cell phone adaptor to take some photos of Venus; zoom in and you may spot it in the photo at left.

Rusty Case, Steve Sinksen and Al Sheidler gathered at Paul Castle Observatory on August 18 and were treated to some "stupendous" views of Jupiter, including (above) this view showing the red spot and a transit of the moon Europa. On the 27th, Al and Rusty went back to the observatory, joined by Byron Davies and Wayland Bauer, and caught this image of Jupiter with two of its Galilean moons.

Roy Gustafson captured these images at his property north of Orion; shown are (top) the Helix Nebula, the Andromeda Galaxy (M31, bottom left) and M110, a companion of Andromeda.

The Niabi Zoo public viewing night on August 21 attracted a good crowd, including a group of Scouts from Davenport; during the session, this image of Saturn with its moons was taken.



September 2021

Astroline

During the last almost-two years I have been busier than ever, meeting many new people, giving lectures, quoting poetry, and advocating observing the night sky.

And Wendee and I have barely left home.

Obviously, I have not been able to give lectures in person since the Covid-19 pandemic began. On the homefront for me, our local Tucson Amateur Astronomy Association meets the first Friday of every month online over Zoom cloud (available at www.tucsonastronomy.org). But almost every day, I reconnect with friends in astronomy clubs around the world.

On Tuesdays, I am a part of Scott Roberts' weekly Global Star Party. (For more , visit: https://explorescientificusa.com/products/explore-alliance-global-star-party) Scott has now had more than 60 of these wonderful events, and I enjoy each one.

On Wednesdays and Saturdays, I am part of the Montreal Centre of the Royal Astronomical Society of Canada, where I meet people I've known for years, especially Carl, one of my best friends since we were teenagers in 1964. As a graduate student at Queen's University in the 1970s, I also was active with the RASC's Kingston Centre.

I have also reconnected with the Denver Astronomical Society, a group I joined in 1963 when I was a patient at the Jewish National Home for Asthmatic Children. That experience was precious back then, and it is even more delightful now!

One of the groups, the Warren Astronomical Society in Michigan, does not use Zoom. Instead, they have WebEx, which is just as simple to use. I have even participated in sessions sponsored by Kansas City's Linda Hall Library, one of the largest science libraries in the world.

Not all of the online sessions are related to astronomy. Our local synagogue has a weekly Torah study session, and Wendee and I are regulars there. They also graciously listen to my poetry quotations, which range from Shakespeare to Chaucer, to this ancient one (from 1556) from Robert Recorde's The Castle of Knowledge:

If Reasons reach transcend the Skie,
Why should it then to earth be bound?
The wit is wronged and led awrie,
If mind be married to the ground.

When the sessions drag on, as they

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In this photo taken by Wendee Wallach-Levy, David Levy tries to get online using the 'little' computer in his observatory.

Andromeda Galaxy is a beautiful sight

If you're thinking of a galaxy, the image in your head is probably the Andromeda Galaxy! Studies of this massive neighboring galaxy, also called M31, have played an incredibly important role in shaping modern astronomy. As a bonus for stargazers, the Andromeda Galaxy is also a beautiful sight.

Have you heard that all the stars you see at night are part of our Milky Way galaxy? While that is mostly true, one star-like object located near the border between the constellations of Andromeda and Cassiopeia appears fuzzy to unaided eyes. That's because it's not a star, but the Andromeda Galaxy, its trillion stars appearing to our eyes as a 3.4 magnitude patch of haze.

Why so dim? Distance! It's outside our galaxy, around 2.5 million light years away - so far away that the light you see left M31's stars when our earliest ancestors figured out how to use stone tools.

Binoculars show more detail: M31's bright core stands out, along with a bit of its wispy, saucer-shaped disc.

Telescopes bring out greater detail, but

The Hubble Space Telescope took this image of the cloudy mass surrounding the Andromeda Galaxy; the dots show the positions of quasars.

This illustration can be used to find the location of the Andromeda Galaxy, also known as M31.

often can't view the entire galaxy at once. Depending on the quality of your skies and your magnification, you may be able to make out individual globular clusters, the galaxy's structure, and at least two of its orbiting dwarf galaxies: M110 and M32.

Light pollution and thin clouds, smoke, or haze will severely hamper observing fainter details, as they will for any "faint fuzzy" object. Surprisingly, persistent stargazers can still spot M31's core from areas of moderate light pollution, as long as skies are otherwise clear.

Modern astronomy was greatly shaped by studies of the Andromeda Galaxy. A century ago, the idea that there were other galaxies beside our own was not widely accepted, and so M31 was called the "Andromeda Nebula."

Increasingly detailed observations of M31 caused astronomers to question its place in our universe – was M31 its own "island universe," and not part of our Milky Way? Harlow Shapley and Heber Curtis engaged in the "Great Debate" of 1920 over its nature. Curtis argued forcefully from his observations of dimmer than expected no-

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Skyward

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sometimes do, I can get fatigued since I am not as young as I was in 1963 or 1979. But it is worth the effort, and I sincerely hope that the Zoom/WebEx experience will outlive the pandemic when it finally ends.

Seeing friends so often like this is wonderful. And on some occasions, I have joined online meetings from a remote site in southeastern Arizona.

Sometimes, my quote tradition is something from scripture, like this gem from the Book of Isaiah:

Thou stretchest out the heavens as a curtain,

And spreadeth them out as a tent to dwell in.

My goodness - I never realized how a few words from the Bible could affect me as much as these do. They describe my experience perfectly - outside, I am peering at the curtain of the night sky. Moreover, the observatory out of which I look at the sky, or the observing pad upon which I stand, is the cosmic tent in which I dwell.

Andromeda

Continued from Page 14

vae, dust lanes, and other oddities that the "nebula" was in fact an entirely different galaxy from our own.

A few years later, Edwin Hubble, building on Henrietta Leavitt's work on Cepheid variable stars as a "standard candle" for distance measurement, concluded that M31 was indeed another galaxy after he observed Cepheids in photos of Andromeda, and estimated M31's distance as far outside our galaxy's boundaries. And so, the Andromeda Nebula became known as the Andromeda Galaxy.

These discoveries inspire astronomers to this day, who continue to observe M31 and many other galaxies for hints about the nature of our universe. Dig into NASA's latest discoveries about the Andromeda Galaxy, and the cosmos at large, 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.

Astronomical League Observing Programs

The Astronomical League offers more than 70 different observing programs, ranging alphabetically from "Active Galactic Nuclei" to "Youth Astronomer. " 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, including a special program in celebration of the Astronomical League's 75th anniversary.

9/1/2021 **TREASURER'S REPORT** from 6/1/2021 to 8/31/2021

description	current period detail	current	YTD
Receipts:			
memberships	1 renewal	30.00	352.50
member donations			30.00
program donations	4 programs plus Niabi	885.00	1085.00
misc donations			
interest		0.14	0.37
banquets			
birdies			
special			
sales	t-shirts	75.00	75.00
other			
Total Receipts		990.14	1542.87

Expenditures:			
programs	Putnam	116.59	166.59
speakers			20.00
PACMO operation	license, storage	398.00	693.26
observatory			301.00
equipment			
maintenance			
Astronomical League		210.00	210.00
insurance		755.00	917.00
operating supplies			
newsletter			
web page			
banquet			
donations			
miscellaneous			
legal		10.00	10.00
observatory upgrade			
other			
adjustments			
Total Expenditures		1489.59	2317.85

Balances	as of 8/31/2021	
previous balance	7834.74	8110.27
net change	-499.45	-774.98
ending balance	7335.29	7335.29
check account		1864.56
money market account		5415.06
savings account		10.23
business special		45.44
cash		0.00
undeposited checks		0.00
Total Cash Assets		7335.29

Popular Astronomy Club of the Quad Cities, Inc.

http://www.popularastronomyclub.org/

UPCOMING EVENTS

Date: September 13, 2021

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

- **Program : Business meeting**
- **Smorgasbord of presentations**

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

There's still time to add your presentation to the Smorgasbord at the September meeting. What you present can be on any astronomy-related topic that you think might be of interest to your fellow PAC members. They want to hear from you! To sign up, contact Dino Milani at (309) 269-4735, email dinomilani@qconguard.com.

PAC also has a public observing night scheduled for Saturday, September 18, at Niabi Zoo. Volunteers are needed to help staff the event; feel free to bring your telescope.

MONTH	NEWSPAPER ARTICLES	MEMBER PRESENTATION	MEETING / PROGRAM
OCT 2021	Paul Levesque	AVAILABLE	October 23 - Annual PAC Banquet; Presentation: "Lunar Laser Ranging Project" by Dr. Russet McMillan, Apache Point Observatory, New Mexico
NOV 2021	AVAILABLE	AVAILABLE	November 8 - Presentation: "M Dwarf Stars and the James Webb Space Telescope" by Katie Melbourne, Ball Aerospace Systems, Broomfield, Colorado
DEC 2021	AVAILABLE	AVAILABLE	December 13 - Presentation: The Year in Review by Roy Gustafson
JAN 2022	AVAILABLE	AVAILABLE	January 10 - Presentation: "Curiosity Paving the Way for Perseverance" by Dr. Rebecca M E. Williams, Planetary Science Institute
FEB 2022	AVAILABLE	AVAILABLE	February 14 - 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	March 14 - Business Meeting; Smorgasbord of Member Presentations
APR 2022	AVAILABLE	AVAILABLE	April 11 - Presentation: "Fantastic Space Discoveries: Theories of Solar System Formation" by Jim Kovac, Chicago Society for Space Studies
MAY 2022	AVAILABLE	AVAILABLE	May 9 - Presentation: "Technology for the Astronomical Community & More" by Matt Dieterich, Technical Services Manager, PlaneWave Instruments, Inc., Adrian, Michigan
JUNE 2022	AVAILABLE	AVAILABLE	June 13 - Presentation: "Sky With Ocean Joined: Scaling the Stars at the U.S. Naval Observatory, 1830 to the Present" by Geoff Chester, Public Affairs Officer, U.S. Naval Observatory, Washington D.C.