

**Reflections** The Newsletter of the Popular Astronomy Club ESTABLISHED 1936

#### **REFLECTIONS from the President**



Our next Popular Astronomy Club meeting will be on Monday, September 12, at 7 p.m. It will be a brief business meeting followed

by short and informal smorgasbord talks by members who are willing to share their astronomy information and discoveries with the rest of us.

Please consider sharing your astronomical discoveries with the rest of the membership by presenting a short topic as a smorgasbord talk. You may have an interesting book or magazine you have read, an astronomy location or museum you have visited, or another program you have attended or viewed online that could be of interest to the rest of us.

If you have something to share, please contact Dino Milani and he will add you to the program. Video images or paper handouts are also useful but not required. We will also have some time at the meeting for members to show their recent observations.

This has not been a good year for our monthly public observing night at Niabi Zoo, as we have had poor weather resulting in cancellation of the July and August events. On September 17, we will have our next monthly public observing session at the Niabi Zoo parking lot. Please plan to attend and share your astronomy interest and knowledge with the public.

On September 22, we will have our first public observing program in the Port Byron area, hosted by the River Valley District Library, and located at the Riverdale Middle School parking lot. It should be an excellent area for observing the stars, in a rural area with few trees and no tall buildings, and where the parking lot lights can be turned out.

The Eastern Iowa Star Party, hosted by the Quad Cities Astronomical Society at the Menke Observatory located at the Wapsi River Environmental Education Center near Dixon, Iowa, will begin on Friday, September 23 and run through Sunday the 25th. This event gives PAC members another opportunity to share the interest in astronomy with members of QCAS and others who attend the EISP.

All of these activities will give us many reasons this month to keep looking up.

#### September 2022



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## Stamp honors Webb Telescope

The U.S. Postal Service has announced that a stamp honoring the James Webb Space Telescope will be released later this month.

The stamp will be formally unveiled at a first-day-of-issue ceremony that will be held at the Smithsonian National Postal Museum in Washington, D.C. on September 8 at 11 a.m. Eastern.

The new "Forever" stamp will be issued in booklets of 20. Orders for the stamp can be made at the USPS website, at <u>usps.com/stamps</u>. The stamps should soon be available at local post offices, and can also be ordered by calling (844) 737 -7826.

The stamp was designed by USPS art director Derry Noyes, using art by James Vaughan and an image provided by NASA. It depicts the Webb Telescope against a starscape, using an image of a distant star and space taken by the telescope early in its mission.

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. Email to: levesque5562@att.net

### 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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# My extraterrestrial vacation home (Part 2)

Last month, I looked at the possibility of colonizing other planets in the Solar System, and how none are actually good candidates due to harsh conditions. This month, we'll look at the moons of Jupiter and Saturn, and at one in particular that has some Earth-like characteristics.

It's currently known that Jupiter has 80 moons and Saturn has 83, all ranging greatly in size, shape and composition. Jupiter's moons Ganymede and Callisto, and Saturn's moon Titan, are all about the same size as the planet Mercury.

My favorite moon is Titan. Titan is an interesting object which might have some attractive characteristics for colonization.

Titan has an atmosphere, consisting of about 95% nitrogen and 5% methane. The atmospheric pressure on the surface is 60% higher than on Earth, comparable to what a scuba diver might experience at a depth of around 20 feet. This is tolerable.

Earth's atmosphere is about 80% nitrogen and 20% oxygen. While there is no free oxygen in Titan's atmosphere, the nitrogen which dominates is very similar to what we have here.

The big issue with Titan is the frigid cold. The surface temperature there is around minus 280 degrees Fahrenheit (minus 175 Celsius). While this is much colder than it ever gets in Antarctica, a human could potentially handle the temperature with very well insulated or heated clothing, and would only need an oxygen mask to breathe. A pressurized spacesuit, like that needed on the surface of the Moon, would not be required on Titan.

Interestingly, despite the fact that Titan is 50% larger than our Moon, the surface gravity is actually less. Titan's gravity is only one-seventh as strong as Earth (the Moon is one-



This composite image showing an infrared view of Saturn's moon Titan was taken by NASA's Cassini spacecraft on November 13, 2015. Titan has both a dense atmosphere that contains oxygen and frozen water.

sixth). That's because Titan is composed mostly of water ice and other ices frozen into its crust.

Titan has an average density of about 1.88 (the density of liquid water is 1.00). Earth's density is 5.51, and the Moon's is 3.34. The Earth and Moon have large, heavy iron cores surrounded by layers of rock. On the other hand, Titan lacks a significant iron core, making it very light. The result is very weak gravity on the surface of Titan.

If you want to lose weight without going on a diet, Titan would be a good place to visit. A 150-pound human would only weigh about 21 pounds on Titan. Weight Watchers, eat your heart out!

Here's a question to mull over: How fast would a skydiver fall if they jumped out of a plane flying over Titan?

The average skydiver here reaches a maximum free-fall speed (i.e. terminal velocity) of

# Skydiving on Titan

#### Continued from Page 3

around 120 miles per hour, or 200 kilometers per hour. This speed depends on the size and weight of the skydiver, and the density of the air they are falling through.

Given Titan's dense atmosphere and low gravity, it would be interesting to try skydiving there and see what happens. Because the air pressure is higher and the temperature is lower, the air density near the surface of Titan is about four times higher than on Earth. Since the gravity is only one-seventh as strong, the terminal velocity might be significantly lower. In fact, if one does the math, we find that a skydiver on Titan would have a terminal velocity of only 22 miles per hour (35 kilometers per hour).

Would a skydiver even need a parachute on Titan? I would guess that doing a bellysmacker face-first onto the ground at 22 miles per hour would not be good, but it might be survivable. To avoid injury, a para-



This freefalling skydiver would reach a terminal velocity of about 22 miles per hours on Titan, compared to 120 miles per hour on Earth. chute would still be needed, though it could be much smaller than one used on Earth, given Titan's thick atmosphere.

Besides the recreational opportunities offered by slow-motion skydiving, another reason Titan might be an attractive spot for real estate development are its beautiful lakefront properties. Yes, Titan actually has lakes, though not ones filled with liquid water.

Titan's lakes are filled with liquid hydrocarbons such as methane and ethane. The H2O on Titan is frozen solid, but could easily be mined as a source of drinking water, and broken down into hydrogen for rocket fuel and oxygen for breathing.

Actually, Titan's huge reserves of hydrocarbons, found both in the lakes and in the atmosphere, could easily be burned using current technology, separating the oxygen from the H2O to generate heat and energy.

Titan and other moons of Saturn, as well as the planet itself, remain visible in the evening sky in September. PAC members will peer at Titan and other objects during our public observing session on September 17 at Niabi Zoo. Let's hope for clear skies, and let's keep looking up!

#### **Alan Sheidler**

#### Amateur astronomers invited to be eclipse ambassadors

NASA, in cooperation with the Astronomical Society of the Pacific, is inviting amateur astronomers and other astronomy enthusiasts to become official Eclipse Ambassadors for two upcoming solar eclipses.

The two North American eclipses are an annular eclipse on October 14, 2023, and a total solar eclipse on April 8, 2024.

Eclipse ambassadors will partner with an undergraduate student or fellow amateur astronomer to coordinate events and activities that engage local communities on or near the eclipse path. The goal is to reach 200 people or more and provide them with eclipse glasses, educational material and other and other resources; at least half of those reached should come from underserved communities.

To qualify, you must complete a threeweek online course with your partner that totals about 12 hours of coursework.

To apply, and for more information, visit this website: <u>eclipseambassadors.org</u>.

# Constellations that didn't make the cut



In 1922, the International Astronomical Union announced the names of 88 constellations that would be used to form the boundaries of sky maps going forward. To mark the centennial of adoption of the modern constellation list, Reflections is looking back at some constellations that were once found on some sky maps, but didn't

#### make the final cut.

Custos Messium, Latin for the "Harvest Keeper," was placed on a celestial globe created in 1775 by French astronomer Joseph Jérôme de Lalande. The name was a play on words honoring a more famous French astronomer, Charles Messier, a contemporary of LaLande who was known for his comethunting acumen.

LaLande drew the constellation from dim stars which are now incorporated into Camelopardalis, Cassiopeia and Cepheus. The constellation was sometimes simply referred to as "Le Messier" and was placed in an area where a comet discovered in 1774 (though not by Messier) first appeared.

British astronomer Thomas Young referred to the constellation as the "Vineyard Keeper" in a chart published in 1807. While the constellation honoring Messier fell out use soon after, his name remains linked to the many celestial objects hunted by amateur astronomers.

# League adds new observing programs

The Astronomical League has announced the addition of two new observing programs.



The new Solar Neighborhood Observing Program is designed to educate participants about stars that are our Sun's nearest neighbors. The program focuses on the more than 200 stars of over



17 magnitude that are within 10 parsecs, or33 light-years, from the Sun.

Through the program, pins and certificates can be earned for naked eye, binocular, telescopic and imaging observations. Details are available on the Astronomical League website, at <u>https://</u> www.astroleague.org/content/solar-

neighborhood-observing-program.

The new Bennett Observing Program is designed as the southern skies equivalent of the Messier Catalog program for the northern latitudes. The program is named for the late Jack Bennett, an astronomer from South Africa who served as president of the Astronomical Society of Southern Africa.

In a catalog published in 1969 and updated in 1974, Bennett compiled a list of 152 deep-sky objects found in the sky south of the equator, including galaxies, globular and open clusters, and nebulae. A certificate and pin will be awarded to those who visually observe 107 of these objects; an additional certificate will be awarded to those who observe all 152.

More information about the Bennett Observing Program is available at <u>https://</u> <u>www.astroleague.org/content/bennett-</u> <u>observing-program</u>.

# MEMBER OBSERVATIONS & CLUB ACTIVITIES



# MEMBER OBSERVATIONS & CLUB ACTIVITIES



PAC's annual picnic took place on August 13 at Paul Castle Observatory. The event featured food, fun and friendship, and also served as a celebration of the 55th wedding anniversary of Wayland and Anne Bauer. While there was no rain, overcast skies meant that no observing session could be held; still, a good time was had by all.









These images were taken by Roy Gustafson; shown at far left is the Pan-STARRS comet, accompanied to its right by an image of the Cocoon Nebula, both taken on August 2. On August 16, Roy captured images of NGC7789 (bottom, center) and the Moon. An August 22 session yielded an image of NGC7023 (the Iris Nebula. bottom riaht): the following night, Roy imaged IC1318 (Sadr Region). Most are stacked images using Stellina.



PAC sponsored an outreach session at Davenport's Eastern Avenue Library on August 5. Those attending got a chance to look through the telescopes and see the Moon and Saturn and its moons, as show by these images taken after sunset.

The photo at right shows members of the Church of Jesus Christ of Latter Day Saints Youth Encampment who toured Menke **Observatory on August** 3 at an event sponsored by the Quad **Cities Astronomical** Society. The photo at left shows Bangles, the Milani family cat, who thought a newly acquired telescope was a purr-fect napping spot.







Chad Potter captured these images of Saturn (above) and the Moon using the telescope at John Deere Middle School on August 10. The other Saturn photo was taken at Paul Castle Observatory on August 17 by Alan Sheidler and Rolando Gamino.









September 2022

#### A wondrous window

On first looking through Baade's window Much have I travell'd in the realms of gold, And many goodly stars and clusters seen; Round celestial islands have I been With telescope after telescope to the night sky hold.

Oft of one wide expanse had I been told That Galileo ruled as his demesne; Yet did I never breathe its pure serene Till I heard Baade speak out loud and bold: Then felt I like some watcher of the skies When a new star cluster swims into his ken:

Through his majestic window looks upon the Milky Way

He star'd at the centre of our galaxy. Like a diamond shining in the sky, with a wild surmise -

Silent, through the mists of space and time.

#### Adapted from the John Keats sonnet, "On First Looking Into Chapman's Homer"

Lying in the western portion of Sagittarius, the Archer, is a small region of sky that has unusual importance for astronomers around the world and which, to me, is one of the most beautiful things in the whole sky.

This region was most thoroughly studied by the German astronomer Walter Baade while using the great 100-inch Hooker reflector at Mount Wilson Observatory in California while he was searching for the center of the Milky Way galaxy. Before this time, the loca-

This image of Baade's Window was taken by Adam Block at the University of Arizona's Mount Lemmon SkyCenter.

tion of our home galaxy's center was not well understood.

Walter Baade had an interesting and unusual life. In the mid-1930s, he lost his application papers for United States citizenship. Consequently, in 1941, he was classified as an enemy alien by U.S. authorities and was held virtually under house arrest.

Somehow a compromise was reached, and he was allowed to state his address as Mount Wilson Observatory. With a monopoly of observing time on the great 100-inch telescope, he concentrated his efforts on the Milky Way.

One of Baade's most important projects was a search for a region of the sky that could be close to the center of the galaxy. He took good advantage of the wartime blackout conditions imposed over the city of Los Angeles. Intended to help obscure the city from attacking warplanes from Japan, the blackout also darkened the sky significantly, enabling Baade to try to find areas near the galactic center.

Although he did not find the center, he did uncover a small area in Sagittarius relatively free of dust. This "window" was slightly south of the main center of the galaxy. The globular cluster NGC 6522 is at the middle of this area,

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# The Summer Triangle's hidden treasures

Though fall begins in September, the night skies this month will bring the lovely Summer Triangle asterism into prime position after nightfall for observers in the Northern Hemisphere.

The Summer Triangle's position high in the sky may make it difficult for some to observe its member stars comfortably, since looking straight up while standing can be hard on one's neck! While that isn't much of a problem for those that just want to quickly spot its brightest stars and member constellations, this difficulty can prevent folks from seeing some of the lesser known and dimmer star patterns scattered around its informal borders.

The solution? Lie down on the ground with a comfortable blanket or mat, or grab a lawn or gravity chair and sit luxuriously while facing up. You'll quickly spot the major constellations about the Summer Triangle's three corner stars: Lyra with bright star Vega, Cygnus with brilliant star Deneb, and Aquila with its blazing star Altair.

As you get comfortable and your eyes adjust, you'll soon find yourself able to spot a few constellations hidden in plain sight in the region around the Summer Triangle: Vulpecula the Fox, Sagitta the Arrow, and Delphinus the Dolphin. You could call these the Summer Triangle's "hidden treasures" – and they are hidden in plain sight for those that know where to look!

Vulpecula the Fox is located near the middle of the Summer Triangle, and is relatively small, like its namesake. Despite its size, it features the largest planetary nebula in our skies: M27, aka the Dumbbell Nebula.

This nebula is visible in binoculars as a fuzzy "star"; when seen through telescopes (especially larger ones), its distinctive shape can be observed more readily.



Some of the hidden treasures which you can find in and near the Summer Triangle can be located using this map.

Planetary nebulae, named as such because their round, fuzzy appearances, were initially thought to resemble the disc of a planet by early telescopic observers, form when stars similar to our Sun begin to die. The star will expand into a massive red giant, and its gasses will then drift off into space, forming a nebula.

Eventually, the star collapses into a white dwarf – as seen with M27 – and the colorful shell of gasses will dissipate throughout the galaxy, leaving behind a solitary, tiny, dense white dwarf star. You are getting a peek into our Sun's far-distant future when you observe M27!

Sagitta the Arrow is even smaller than Vulpecula – in fact, it's the third smallest constellation in the sky. Located between the stars of Vulpecula and Aquila the Eagle, Sagitta's stars resemble its namesake arrow.

Sagitta also contains an interesting deepsky object: M71, an unusually small and young globular cluster whose lack of a strong central core has long confused and intrigued *Continued on Page 13* 

## Summer Triangle treasures

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astronomers. It's visible in binoculars, and a larger telescope will enable you to separate its stars a bit more easily than most globulars; you'll certainly see why it was thought to be an open cluster.

Delicate Delphinus the Dolphin appears to dive in and out of the Milky Way near Aquilla and Sagitta. Many stargazers identify Delphinus as a herald of the fainter water constellations, rising in the east after sunset as fall approaches. The starry dolphin appears to leap out of the great celestial ocean, announcing the arrival of more wonderful sights later in the evening.

Want to hunt for more treasures? You'll need a map, and the Night Sky Network's "Trip Around the Triangle" handout is the perfect guide for your quest! Download one before your observing session at <u>TriangleTrip</u>.

While you wait for the Sun to set, or skies to clear, you can find out more about the objects hidden inside these treasures by checking out NASA's latest at nasa.gov.

**David Prosper** 



This image of M71, a globular cluster found in the constellation Sagitta inside the Summer Triangle, was taken by the Hubble Space Telescope. It is one of the smallest, and youngest, clusters found in the Milky Way.

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 <u>nightsky.jpl.nasa.gov</u> to learn more.

# Baade's window

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and NGC 6528 is near its edge.

Astronomers still use this window to study stars in the Milky Way's central bulge. Important information on the internal structure of the Milky Way is being better understood by measurements made through Baade's Window.

The window's shape is irregular in outline and delimits about 1 degree of the sky, an area of about two moon diameters. It is centered on NGC 6522 which might be, at 12 billion years, the oldest star cluster in the sky.

Baade's window is the largest of the six areas through which stars in the Milky Way's central bulge can be seen. Stars observed here can be called BW (for Baade's Window) stars; similarly giant stars can be called BW giants.

OGLE (the Optical Gravitational Lensing Experiment) and other observation programs have successfully detected extrasolar planets orbiting around central stars in this area.

On a rare clear evening during the summer of 2022, I gazed at the clusters and stars through Baade's Window. I shall never forget the exquisite majesty of this distant region which, thanks to Walter Baade, allows me to peer toward the middle of the enormous Milky Way galaxy which is our home.



# Date: September 12, 2022

Event: Regular Meeting @ 7 p.m. Location: Zoom / Butterworth Center Program: Smorgasbord of Member Presentations

If you'd like to make a presentation, contact Dino Milani at dinomilani@qconguard.com

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

#### **UPCOMING EVENTS**

- September 12: PAC Meeting, Butterworth Center, 7 p.m.; smorgasbord of presentations
- September 17: Niabi Zoo public viewing
- September 22: River Valley District Library, Riverdale School, Port Byron (Rain date September 29)
- September 23-24: Eastern Iowa Star Party
- October 8: Girl Scout campout at Camp Liberty
- October 20: Kewanee Central School, family event (tentative)
- October 15: Niabi Zoo public viewing
- October 21: Cambridge Elementary School, 'Lights On After School'
- **October 22:** Annual PAC Banquet (*no regular monthly meeting*); presentation on "Next Generation Telescopes" by Dr. Dennis Roscoe, NASA Solar System Ambassador
- October 29: PAC/QCAS field trip to Witte Observatory, Sperry, Iowa (Rain date November 5)
- November 19: Niabi Zoo public viewing (last of season)

# **RSVPs due for the Eastern Iowa Star Party**

The annual Quad Cities Astronomical Society Eastern Iowa Star Party will be held the weekend of September 23-25 at the Menke/QCAS Observatory at the Wapsi River Environmental Education Center.

The star party will give amateur astronomers a chance to gather, exchange ideas, meet new friends and catch up with old ones, and hopefully enjoy three nights of clear, dark skies.

In addition, those attending will receive an update on the recent move of the QCAS dome to the Menke Observatory, and on the plan to construct a second, larger roll-off structure on the site. Ground was recently broken and concrete poured for that structure.

Weather permitting, attendees will also see a demonstration of the remote accessible observatory at the Wilton, Iowa, School.

No registration fee will be charged for this year's EISP; however, donations for snacks and beverages, and the observatory project, would be appreciated.

Those who are planning to attend are asked to RSVP as soon as possible. To RSVP, and for more information, contact Jeff Struve at pwrhsepro@aol.com.

The foundation has been laid for the new roll-off structure that will be built at Menke Observatory.

Volunteers are needed for these events; to make presentations at PAC 'smorgasbord' meetings; and to write articles and provide input for the monthly 'Skywatch' column and 'Reflections.' Please help if you can; your participation makes PAC go!