Reflections

The Newsletter of the Popular Astronomy Club

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Affiliated with

January 2023

REFLECTIONS from the President

Dale Hachtel

We start 2023 in the cold Midwestern winter weather, but there are still things to look at in the sky at this time.

Clear days may be rare in winter, but when they occur, they can be great times for naked eye observing, without the need to set up and align telescopes in the cold and wind. A couple of conjunctions that will take place this winter would be worth viewing, if the weather cooperates.

On January 22, right at sundown, Venus and Saturn will be near their closest possible conjunction. You will need a clear view to the west-southwest to see this conjunction before both planets set.

The conjunction between Mars and the Moon on January 30 may be much easier to view; that conjunction will occur between 11 p.m. and midnight.

On March 2, a Venus-Jupiter conjunction will occur. As with the Venus-Saturn conjunction earlier in the year, a clear view to the west-southwest will make for the best viewing.

Several interesting programs are planned for our monthly meetings, but have not yet confirmed. Watch future newsletters and the PAC website for details as they become available.

This year, we will also have three opportunities for smorgasbord talks by members. I would like to encourage you to plan to give a short talk about your favorite astronomical object – whether it is a planet, star, galaxy, nebula, cluster, comet, etc. – or any other astronomy-related subject

This should be a good year to keep looking up!

Two major conjunctions of Venus, with the planets Saturn and Jupiter, will be visible this winter. Find a place with a clear view to the southwest to see these planets align.

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PAC partners with library

The Popular Astronomy Club will host an outreach event at the Moline Public Library on Wednesday, January 18. PAC volunteers are needed to support the event, which begins at 6 p.m. and is scheduled to last one hour.

The "PNG Astronomy" event is taking place under a partnership between PAC and the library, under an initiative known as "Project Next Generation." It is designed for children ages 10 to 18 in 4th grade through high school.

During the event, PAC members will explain how telescopes work, teach the use of charts to find planets and stars, and answer questions from students. Similar events will take place at the Moline Public Library later in 2023.

Students who want to take part should register in advance. Click on this link to register and for more information:
Moline Library Event

You can also register and learn more by calling the library at (309-) 524-2470.

Submissions to Reflections are always welcome! Send your photos, articles and other items 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

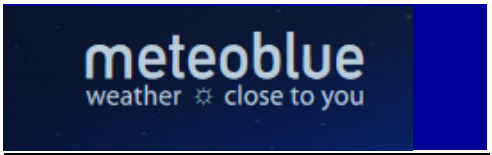
NCRAL SPRING Seasonal Messier List

NCRAL SUMMER Seasonal Messier List

NCRAL AUTUMN Seasonal Messier List

NCRAL WINTER Seasonal Messier List

H0W'S THE WEATHER?



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SUMMARY OF DECEMBER PAC MEETINGS

The Popular Astronomy Club held a board meeting at 6 p.m., followed by a general membership meeting at 7 p.m., at the Butterworth Center in Moline on December 12.

Those present for the board meeting were PAC President Dale Hachtel; Vice-President Dino Milani; Past President / Director of Observations Al Sheidler; Secretary Paul Levesque; Treasurer Michael Haney; Observatory Director Rusty Case; and Astronomical League (ALCOR) Director Roy Gustafson. Wayland and Anne Bauer were also present.

The above represented those who were present for the membership meeting; another 15 joined the membership meeting via Zoom, including guests and members of other astronomy clubs in the region.

Dale began the board meeting by summarizing club activities for 2022. He noted that PAC outreach events were attended by more than 1,600 members of the public during the year, a substantial increase from both 2020 and 2021, when many outreach events were canceled due to COVID restrictions.

PAC achieved these numbers despite the fact that four of the monthly public observing nights at Niabi Zoo, out of nine planned, had to be canceled due to weather. In some pre-COVID years, more than 2,000 members of the public attended outreach events, and Dale stated that such attendance could be achieved again as the recovery from COVID continues and also with a little cooperation from the weather.

Many organizations have already been in contact about scheduling outreach events in 2023, and PAC will continue its partnerships with John Deere Middle School in Moline and the Moline Public Library.

Dino said that keeping the club's Facebook page updated had helped publicize club activities and praised Sara Sheidler for her work on the social media site.

Michael Haney presented the treasurer's report, which showed an ending balance of $17,643.65. It was noted that many of organizations that have sponsored PAC outreach events have been generous with their contributions to the club.

PAC's finances will soon benefit from proceeds that will be donated from the Terry Dufek trust. Those funds will be reflected in the next treasurer's report. Michael said that it might make sense for some PAC funds to be transferred to a certificate of deposit or other instrument that would pay higher interest than a simple savings and checking account; board members agreed and will await a further report on this idea.

Roy noted that the Astronomical League had recently made some changes in its by-laws. He will review these changes further to see what impact they might have on PAC, although he expects that any changes would be minor. Rusty reported that he and Al had performed some repairs to the dome at Paul Castle Observatory, which now works well again. The

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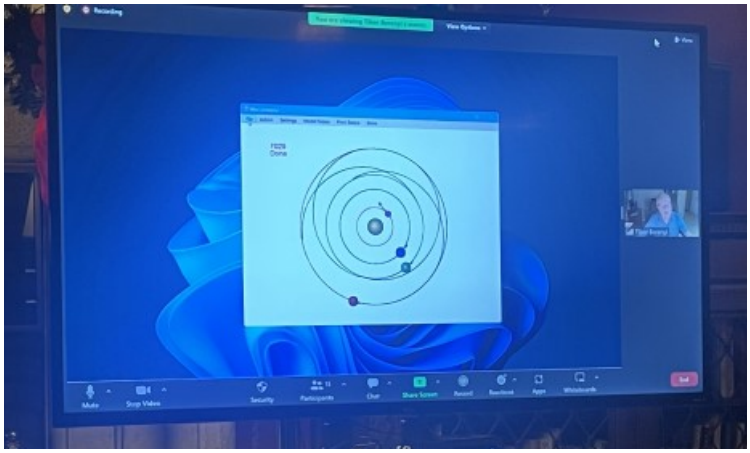

The presentation by Ted Berenyi demonstrated a computer model showing the effect of Newtonian physics on planetary orbits.

December meetings

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PACMO is now in winter storage at SunRys in Coal Valley.

A summary of towing and transportation costs for the PACMO for 2022 was presented to the board; per the summary, $114.43 in reimbursement is owed to Rusty, and $209.98 is owed to Al. On a motion by Roy and second by Dino, the board authorized the reimbursement payments in those amounts.

A current inventory of the telescopes owned by PAC was presented. The telescopes are used at outreach events and also can be borrowed by PAC members. Roy asked if another telescope capable of solar viewing could be purchased, which would accommodate more daytime outreach events.

Popular Astronomy Club
Income & Expenses
September through November 2022

	Sep - Nov 22	Jan - Nov 22
Ordinary Income/Expense		
Income		
Banquet Inc.	555.00	555.00
Donation		
Misc.	187.25	7,437.25
Program	678.00	2,081.10
Total Donation	865.25	9,518.35
Interest Income	0.09	0.46
Membership		
Family Member	105.00	105.00
Patron	80.00	80.00
Regular	482.50	737.50
Supporting	40.00	40.00
Sustaining	180.00	180.00
Total Membership	887.50	1,142.50
Misc. Inc.	15.00	215.00
Sales	0.00	15.00
Total Income	2,435.84	11,557.31
Expense		
Banquet Exp.	393.42	493.42
Castle Observatory	0.00	201.00
Charitable Contributions	0.00	50.00
Dues and Subscriptions	0.00	253.00
Honorarium	100.00	300.00
Miscellaneous Expense	50.00	50.00
PACMO		
Operation	0.00	366.00
Rent	306.00	612.00
Total PACMO	306.00	1,577.00
Reimbursement	0.00	314.69
Total Expense	849.42	3,236.11
Net Ordinary Income	1,584.42	8,221.20
Net Income	1,584.42	8,221.20

The telescope available for check-out at the Scott County Library in Eldridge apparently has some problems with focusing and is in need of repair. Rusty now has the telescope and has ordered a replacement part which will arrive in about a month. He will then complete the needed repair.

Since assuming the recently created position of Director of Observations, Al has generated a number of observing lists, including lists of "Niabi-oids" suitable for public events and other lists that can be used at Paul Castle Observatory and Menke Observatory. He said that he had developed a spreadsheet that makes generating such lists relatively easy.

Al noted that more PAC t-shirts would soon need to be ordered, especially in sizes that are commonly requested. T-shirts are given "free" to new club members and also sold to any club member, or member of the public, who wants one.

The board meeting concluded with a discussion of the schedule for 2023 and, with pace expected to increase, whether there were enough volunteers to cover all events.

Dino said that PAC should avoid scheduling

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December meetings

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three events in one week, as has happened in the past. Dale said that he had talked to Niabi Zoo about scheduling rain dates for one week after the regularly scheduled monthly outreach events; the zoo seems receptive to this plan.

Dale said that members should be encouraged to do presentations at monthly meetings, adding that he was in the process of lining up outside presenters for 2023. The board agreed that the practice of paying honorariums, and travel expenses when needed, to outside presenters should continue.

The board meeting adjourned at 6:55 p.m., and Dale called the membership meeting to order at 7 p.m. The meeting featured a presentation via Zoom by Ted Berenyi, a John Deere retiree who has developed a computer model showing the effects of Newtonian physics on the orbits of planets and other objects.

Ted's model showed how changes in the orbit of one planet affected the orbits of other planets, and also how the orbits could be affected when disrupted by a comet. He showed the impact of both elastic and non-elastic collisions, including how an inelastic collision could increase the mass of a planet and cause major disruptions in the orbits of other planets.

Following the presentation, a business meeting was held. During the business meeting, club officers presented information to members similar to that discussed at the board meeting, above.

The treasurer's report was presented to the general membership, and it was accepted, following a motion by Dino and second by Wayland.

Dale noted that summaries of both the board and the membership meetings had been published as articles in Reflections, as written by secretary / newsletter editor Paul Levesque. These articles are sent to Dale and other board members in advance for review and correction as necessary. Dale proposed that these summaries be accepted as minutes of these meetings, for the record. After a motion by Roy and second by Al, the proposal passed.

Following the business meeting, Roy presented a "Year in Review" slide show. The slide show focused on the club's outreach activities and included a tribute to Terry Dufek, who passed away in 2022.

Some member observations were then presented, including photos and videos depicting the recent occultation of Mars by the Moon.

To wrap up the meeting, Dale stated that 18 public outreach events were already on the agenda for 2023 and asked that club members volunteer to help out at these events. He noted that presenters covering a number of interesting topics would highlight monthly meetings in the year to come, and asked that club members also make presentations at meetings and submit articles for the monthly "Skywatch" column in the local newspaper.

Anne Bauer then expressed her appreciation for the job done by Dale as PAC president, and by all other PAC officers for giving their time and talent to the club.

A recording of the meeting is available on YouTube via the following link: https://youtu.be/BPqHIyN-ahI.

The meeting adjourned at 8:25 p.m. The next membership meeting is scheduled for January 9 at the Butterworth Center and via Zoom.

Winter is a good time for naked eye observing

Winter is actually a good time to go outside on a clear, dark night and gaze up at the night sky for naked eye observing without a telescope. Without spending time in the cold to set up and align a telescope, you can revisit some of the noted winter constellations.

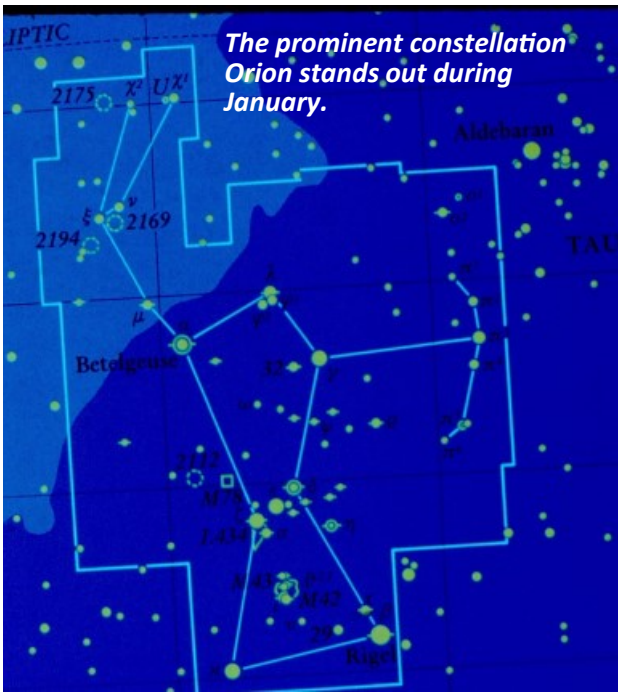
In January, facing south to southeast in the evening, you can see the constellation Orion the Hunter. Several bright stars outline the shape of Orion, and the three stars in a row define Orion's belt.

The upper left star in Orion is known as Betelgeuse, and the lower right star is called Rigel. Both are among the 10 brightest stars in the sky. Both are also supergiant stars much larger than our Sun; however, they are much different from each other.

Look closely and you may notice that Rigel is bluish white in color, indicating it is very hot as stars go. Betelgeuse is a red supergiant, and many times larger than Rigel, but only about one-quarter as hot.

Following Orion's belt to the left (or southeast), you soon come to Sirius, the brightest star in the sky. Sirius is also known as the "Dog Star" because of its location in the constellation Canis Major, the Greater Dog.

By going back to Orion's belt, and following it about the same distance in the opposite direction from Sirius, you come to the bright start Aldebaran, in the constellation Taurus. You may notice some much dimmer stars around Aldebaran. This is the star cluster called the Hyades, which is actually behind Aldebaran.



The prominent constellation Orion stands out during January.

Continuing away from Orion, again about the same distance, you come to another star cluster, the Pleiades. This is a cluster of newly forming stars. Most observers can see five to seven stars with the naked eye; observations with telescopes, though, show that there are over 1,000 stars in the cluster.

While viewing this area of the sky during January, be sure to notice the planet Mars in the area of the Pleiades and Hyades. It will appear somewhat brighter than the stars and also have a reddish color.

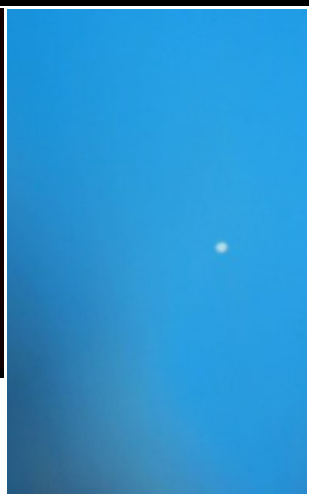
A special event for any stargazers will occur on January 30, between 11 p.m. and midnight. The Moon will be seen as slightly larger its half-moon phase, and will pass next to Mars as a conjunction.

Whether you observe this month with or without a telescope, let's hope for clear skies and relatively mild temperatures, and let's keep looking up!

Dale Hachtel

The Pleiades
star cluster contains over 1,000 stars, though only seven are

MEMBER OBSERVATIONS
& CLUB ACTIVITIES



Al Sheidler captured these images of the Sun last month; the image to the right was taken on December 4, while the image to the left was taken on December 18, both using the Meade 10-inch LX200 telescope recently donated to PAC equipped with a #5 neutral density filter. As a bonus on December 18, Al captured a daytime image of Jupiter .

Al Sheidler went out to Paul Castle Observatory on the evening of December 7 and took a series of photos of the occultation of Mars by the Moon, using the observatory's telescope with a D7500 camera. The image above, showing what looks like 'Mars-rise' on the Moon, was sent in Roy Gustafson, who captured it using his 5-inch Celestron.

IN LOVING MEMORY OF DEPARTED MEMBERS

We mourn the loss of these PAC members who passed away in 2022

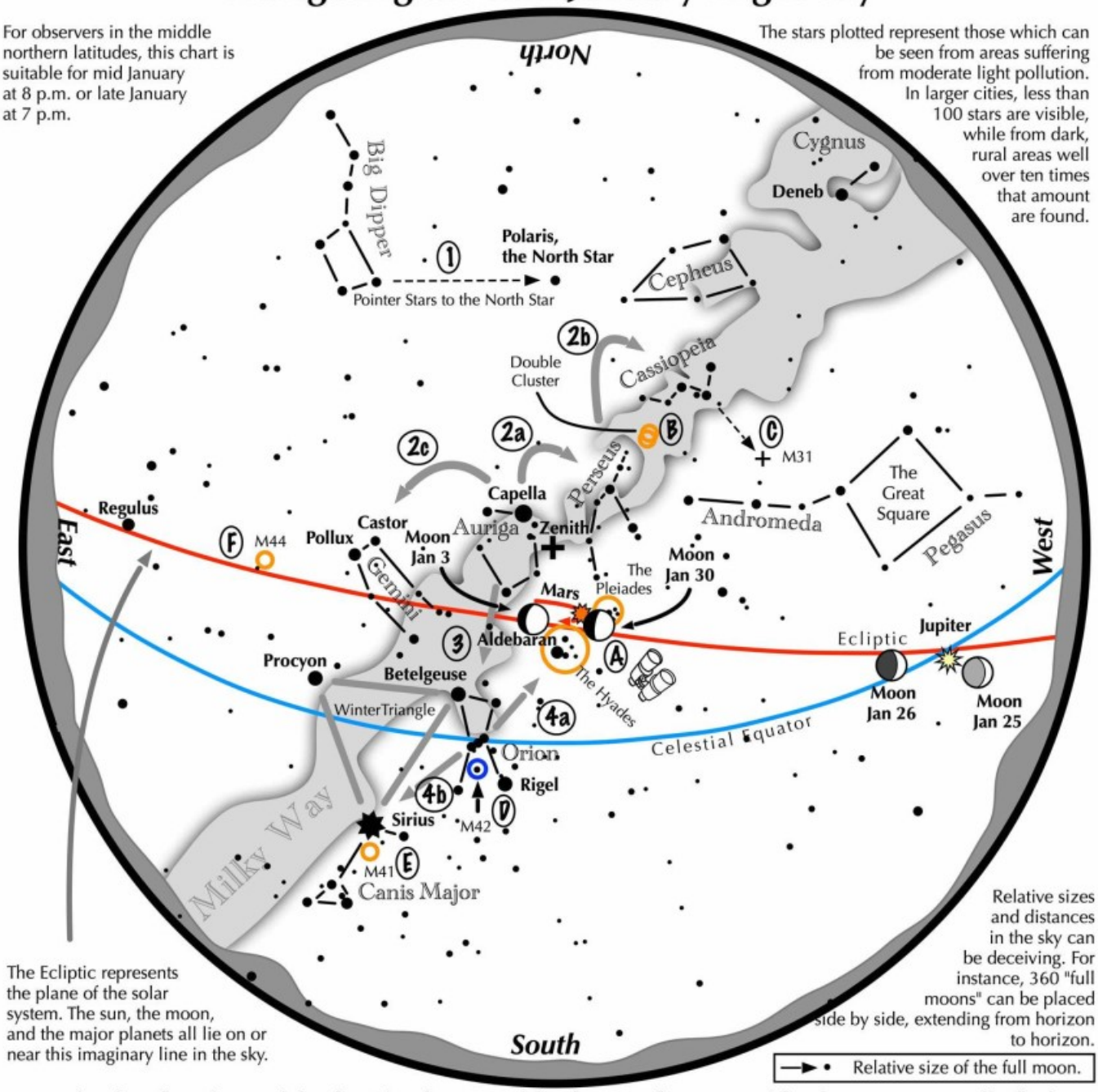
Terry Dufek John Hendley

John Weber Andy Zeglin

Navigating the mid January Night Sky

For observers in the middle northern latitudes, this chart is suitable for mid January at 8 p.m. or late January at 7 p.m.

The stars plotted represent those which can be seen from areas suffering from moderate light pollution. In larger cities, less than 100 stars are visible, while from dark, rural areas well over ten times that amount are found.



The Ecliptic represents the plane of the solar system. The sun, the moon, and the major planets all lie on or near this imaginary line in the sky.

Relative sizes and distances in the sky can be deceiving. For instance, 360 "full moons" can be placed side by side, extending from horizon to horizon.

→• Relative size of the full moon.

Navigating the winter night sky: Simply start with what you know or with what you can easily find.

1. Above the northeast horizon rises the Big Dipper. Draw a line from its two end bowl stars upwards to the North Star.
2. Face south. Overhead twinkles the bright star Capella in Auriga. Jump northwestward along the Milky Way first to Perseus, then to the "W" of Cassiopeia. Next Jump southeastward from Capella to the twin stars Castor and Pollux of Gemini.
3. Directly south of Capella stands the constellation of Orion with its three Belt Stars, its bright red star Betelgeuse, and its bright blue-white star, Rigel.
4. Use Orion's three Belt stars to point to the red star Aldebaran, then to the Hyades, and the Pleiades star clusters. Travel southeast from the Belt stars to the brightest star in the night sky, Sirius.

Binocular Highlights

A: Examine the stars of the Pleiades and Hyades, two naked eye star clusters. **B:** Between the "W" of Cassiopeia and Perseus lies the Double Cluster. **C:** The three westernmost stars of Cassiopeia's "W" point south to M31, the Andromeda Galaxy, a "fuzzy" oval. **D:** M42 in Orion is a star forming nebula. **E:** Look south of Sirius for the star cluster M41. **F:** M44, a star cluster barely visible to the naked eye, lies to the southeast of Pollux.

January 2023

More sorrow

"When sorrows come, they come not single spies, But in battalions." (Hamlet)

This column begins with a delightful quotation from Hamlet, where King Claudius reflects on the deaths of Hamlet's father, Polonius, and the madness of Ophelia. In this lonely period of my own life, the one constant I have is being able to continue doing the stargazing that I love so much.

In recent months, the losses of Don Machholz, Constantine Papacosmas, and Wendee (my wife) have tested the strength of observing the night sky as never before. But I must add to this the passing of my closest friend from my youth, Carl Jorgensen, on October 18.

Of these four transitions that occurred late this year, two of them – Don and Carl – both died from COVID-19. This is strong evidence that we are nowhere near being done with this dreadful illness.

My lifelong friendship with Carl began in November 1963. I had just returned from a 14-month stay at the Jewish National Home for Asthmatic Children in Denver. At the observatory of the Royal Astronomical Society of Canada in Montreal, Isabel Williamson introduced "young Carl Jorgensen" to "young David Levy," and our friendship never wavered over 59 stargazing years after that.

We both especially enjoyed observing shooting stars. In the late summer of 1965, Carl and I were counting Perseid meteors (that all seemed to radiate from the constellation of Perseus) when Carl began to sing to himself the lyrics of a newly released song. Carl went on and on under that clear sky.

"Carl," I asked, "what are you singing?"

"Bob Dylan's new song, 'Like a Rolling Stone.' "

"How long is this song supposed to last?"

"About six minutes."

"Carl, you've been singing it for over half an hour." By the next time Carl and I met for observing, I had become a staunch Dylan fan as well.

In March 1976, those of us who liked comets were still reeling from the failure of Comet Kohoutek to live up to expectations. Another comet, found by Richard M. West, was supposed to be in the predawn sky, and Carl drove me out to see it.

As we drove into a darker sky south of Montreal, I looked out past Carl's window and saw a magnificent comet rising in the east. Carl reacted to my exclamation: "OK, we'll find a spot, set up the telescope, and try to find it."

"Carl, just look to your left!" Carl glanced out his window, and nearly drove the car off the road. What an unforgettable morning that was.

Carl had a lifelong interest in double stars. His favorite (and mine) was a beautiful triple star in the constellation of Cepheus. Known as Struve 2816, it is a magnificent triple sun. It is easy to find and wonderful to watch.

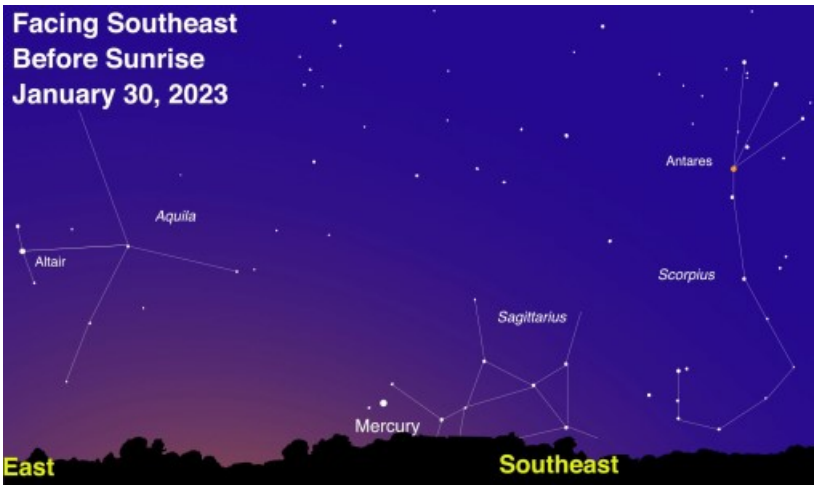
It is particularly evocative to think of Struve 2816 now. "Doubt that the stars doth shine," Hamlet might have complained, but I think that even he would enjoy being with Carl to enjoy the sight of that lovely star.

Carl Jorgensen and his daughter, Christine, are shown in front of the RASC Montreal Centre Observatory, which has since renamed for Isabel K. Williamson.

Spot the Messenger: Observe Mercury

Most planets are easy to see in the night sky, but have you ever spotted Mercury?

Nicknamed “the Messenger” for its speed across the sky, Mercury is also the closest planet to the Sun. Its swift movements close to our Sun accorded it special importance to ancient observers, while also making detailed study difficult. However, recent missions to Mercury have resulted in amazing discoveries, with more to come.



Because it’s so close to the Sun, Mercury is only visible just before sunrise and just after sunset.

Mercury can be one of the brightest planets in the sky – but also easy to miss! Why is that? Since it orbits so close to the Sun, observing Mercury is trickier than the rest of the “bright planets” in our solar system: Venus, Mars, Jupiter, and Saturn.

Mercury always appears near our Sun from our Earth-bound point of view, making it easy to miss in the solar glare or behind small obstructions along the horizon. That’s why prime Mercury viewing happens either right before sunrise or right after sunset; when the Sun is blocked by the horizon, Mercury’s shine can then briefly pierce the glow of twilight.

This image taken during NASA’s MESSENGER mission shows the high number of craters on the planet’s surface.

Mercury often appears similar to a “tiny Moon” in a telescope since, like its fellow inner planet Venus, it shows distinct phases when viewed from Earth.

Mercury’s small size means a telescope is needed to observe its phases, which can’t be discerned with your unaided eye. Safety warning: If you want to observe Mercury with your telescope during daytime or before sunrise, be very careful: you don’t want the Sun to accidentally enter your telescope’s field of view. This is extremely dangerous and can not only destroy your equipment, but, even worse, permanently blind you as well!

That risk is why NASA does not allow space telescopes like Hubble or the James Webb Space Telescope to view Mercury or other objects close to the Sun, since even the tiniest error could destroy billions of dollars worth of irreplaceable equipment.

Despite being a small and seemingly barren world, Mercury is full of interesting features. It’s one of the four rocky (or terrestrial) planets in our solar system, along with Earth, Venus, and Mars.

Mercury is the smallest planet in our Solar

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Mercury

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System, and also possesses the most eccentric, or non-circular, orbit of any planet as well. During a Mercurian year of 88 Earth days, the planet orbits between 29 million and 43 million miles from our Sun – a 14-million-mile difference!

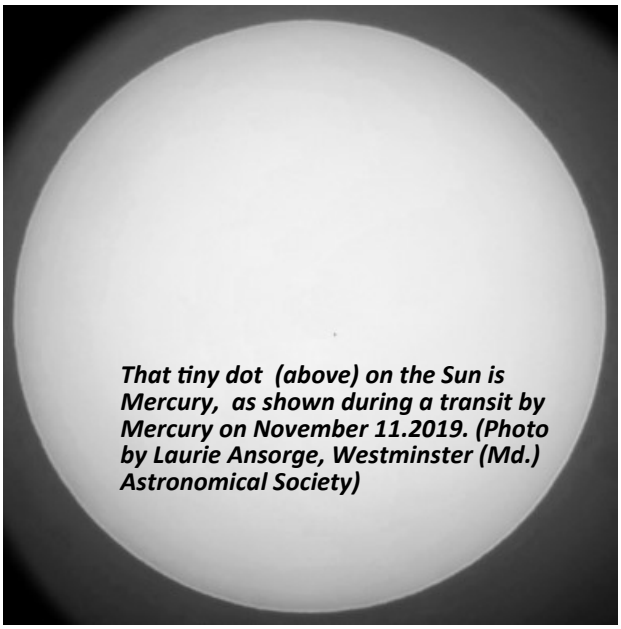
Surprisingly, Mercury is not the hottest planet in our solar system, despite being closest to the Sun; that honor goes to Venus, courtesy of its thick greenhouse gas shroud of carbon dioxide.

Since Mercury lacks a substantial atmosphere and the insulating properties a layer of thick air brings to a planet, its temperature swings wildly between 800 degrees Fahrenheit (427 degrees Celsius) in daylight and minus 290 degrees Fahrenheit (minus 179 degrees Celsius) at night.

Similar to our Moon, evidence of water ice is present at Mercury's poles, possibly hiding in the frigid permanent shadows cast inside a few craters. Evidence for ice on Mercury was first detected by radar observations from Earth, and follow-up observations from NASA's MESSENGER mission added additional strong evidence for its presence.

Mercury sports a comet-like tail made primarily of sodium which has been imaged by skilled astrophotographers. The tail results from neutral atoms in its thin atmosphere being pushed away from Mercury by pressure from the nearby Sun's radiation..

NASA's Mariner 10 was Mercury's first robotic explorer, flying by three times in 1974 and 1975. Decades later, NASA's MESSENGER probe (for "Mercury Surface, Space Environment, Geochemistry and Ranging") first visited Mercury in 2008, flying by three times before settling into an orbit in 2011.



That tiny dot (above) on the Sun is Mercury, as shown during a transit by Mercury on November 11.2019. (Photo by Laurie Ansorge, Westminster (Md.) Astronomical Society)

MESSENGER thoroughly studied and mapped the planet before smashing into Mercury at mission's end in 2015. Since MESSENGER, Mercury was briefly visited by Bepi-Colombo, a joint European Space Agency / Japan Aerospace Exploration Agency probe, which first flew by in 2021 and is expected to enter orbit in 2025, after completing six flybys.

Need more Mercury in your life? Check out NASA's discoveries and science about Mercury at solarsystem.nasa.gov/mercury/, and visit the rest of the universe 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.

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That's the "unlucky" number of full moons we'll have in 2023, on the following dates and with the following traditional names:

January 6 (Wolf Moon) / February 5 (Snow Moon) / March 7 (Worm Moon) / April 6 (Pink Moon) / May 5 (Wolf Moon) / June 4 (Strawberry Moon) / July 3 (Buck Moon) / August 1 (Sturgeon Moon) / August 31 (Blue Moon) / September 29 (Harvest Moon) / October 28 (Hunters Moon) / November 27 (Beaver Moon) / December 27 (Cold Moon)

UPCOMING EVENTS

Date: January 9, 2023

Event: Membership meeting @ 7 p.m.
Location: Butterworth Center / Zoom
Program: TO BE DETERMINED

Throughout 2023, PAC Membership meetings will be held on the second Monday of the month at 7 p.m. at the Butterworth Center in Moline; no regular meetings scheduled for August (annual picnic) and October (annual banquet).

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

Cub Scout 'PAC' earns its badges

Wayland and Anne Bauer joined Roy and Jan Gustafson at Neil Armstrong Elementary School in Bettendorf on November 29 for an outreach event sponsored by Cub Scout Pack 81. The event attracted 57 participants, including 38 scouts and 17 adults and family members. Those attending were shown a PowerPoint presentation on the Solar System and took part in astronomy-related activities, including demonstrating the distance between the planets using a roll of toilet paper and making a constellation finder out of toilet paper tubes. Cloudy skies made outside observing possible, but telescopes were set up inside and used to view objects such as the stars on the American flag. Some of the Cub Scouts earned merit badges for participating in the event.

Public Astronomy Club 2023 Statistics

Total activities planned: 79	Special programs: 8
Activities postponed or canceled: 16	Other activities: 28
Total activities completed: 63	Paul Castle observing: 15
Public outreach activities: 35	Field trips, etc.: 6
Monthly programs: 12	Meetings: 5
Public Observing: 15	Miscellaneous: 2