

Super Bowl in the sky 'Winter Football' encompasses many bright stars

Winter is a great time for indoor spectator sports like basketball. However, if you can handle the cold, there's an outdoor spectator sport I'd encourage you to try.

I'm not referring to the Super Bowl, which takes place this month. I am talking about a football in the night sky – the "Winter Football."

The Winter Football is an asterism, defined as a group of stars that form a pattern in the sky but isn't classified as a constellation. The most common example of an asterism is the Big Dipper, which is part of the constellation Ursa Major.

The asterism called the Winter Football is a giant hexagon of bright stars encompassing several constellations that covers nearly half of the southern sky



during the winter months. The shape is similar to a football, hence the name.

Starting at the bottom and working your way clockwise, the Winter Football is formed by the bright stars Sirius, Procyon, Pollux, Castor, Capella, Aldebaran and Rigel. These are some of the brightest stars in the sky, so you don't need a telescope to see them. Let's take a journey around the Winter Football and visit some of these objects.

At the bottom of the Winter Football you'll find Sirius – the "Dog Star," the brightest star in the sky (outside of our Sun). Sirius resides in the constellation Canis Major, "The Big Dog."

If you look south in the early evening, you can't miss this very bright star. At about 8 p.m., Sirius will be almost due south and about a third of the way up from the horizon.

Sirius is 8.6 light-years from Earth, making it the seventh closest star. Though it appears as one to the naked eye, Sirius is actually a binary star system consisting of two stars orbiting each other.

Sirius A, the brighter of the two, is a bluish white star with a surface temperature of 18,000°F. It is *Continued on Page* 7



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The Popular Astronomy Club of the Quad Cites – a twostate region comprised of several communities along the Mississippi River in Iowa and Illinois – is a non-profit organization that was founded in 1936. PAC is dedicated to promoting and advancing amateur astronomy, and to informing and educating its members and the general public about astronomy in an engaging, inclusive manner. Because PAC believes that astronomy is for everyone,

membership in PAC is open to anyone with an interest in the wonders of the night sky.

To learn more, visit PAC's website, at <u>www.popularastronomyclub.org</u>, or find us on Facebook at <u>www.facebook.com/QCPAC</u>. To contact PAC, send an email to <u>popularastronomyclub@gmail.com</u>.

REFLECTIONS Reflections is a free monthly newsletter published by the Popular Astronomy Club. It is intended to serve all members of the club as well as the amateur astronomy community as a whole in the Quad Cities area.

Reflections serves as an open forum for PAC members and others with an interest in promoting amateur astronomy. Opinions expressed in Reflections are not necessarily those of the club, nor of any individual club officers or members, nor of any other businesses or organizations supporting PAC.

Submissions to Reflections are welcome and should be sent via email to <u>levesque5562@att.net</u>. Photos which are submitted should be high resolution in .jpeg format when possible. Text submissions need not be formatted and should be sent as Word attachments when possible. Submissions may be edited for spelling, grammar, style, clarity and length. Questions and comments should be sent to Paul Levesque, Reflections editor, at the email address above. Back issues of Reflections are available here: popularastronomyclub.org/news-letters.

POPULAR ASTRONOMY CLUB OFFICERS

President: Dale Hachtel (<u>dale_hachtel@msn.com</u> / 614-935-5748)
Vice President: Dino Milani (<u>dinomilani@qconguard.com</u> / 309-269-4735)
Secretary / Newsletter Editor: Paul Levesque (<u>levesque5562@att.net</u> / 309-236-1726)
Treasurer: Michael Haney (<u>mhaney32@yahoo.com</u> / (309) 755-7935)
Astronomical League Correspondent: Roy Gustafson (<u>astroroy46@gmail.com</u> / (309)526-3592)

Observatory Director: Rusty Case (rustycase32@gmail.com / (563) 349-2444

Observation Coordinator / Past President: Alan Sheidler (adsheidler@gmail.com / (309) 797-3120)





The Popular Astronomy Club is a founding member of the Astronomical League, and is a member of the North Central Region of the Astronomical League (NCRAL). To learn more, visit the Astronomical League's website at <u>www.astroleague.org</u> and the NCRAL website at <u>ncral.wordpress.com</u>

REFLECTIONS



REFLECTIONS FROM THE PRESIDENT

With clouds, snowstorms and bitter cold, it was difficult to do much observing in January this year. While thinking ahead to the April 8 eclipse of the Sun, it was not possible to check out solar observing equipment without the sun being visible.

At the end of the month, we provided our first special program of 2024 at the Moline Public Library. We communicated about PAC and its mission, and ed-

ucated those attending on the astronomy of eclipses and how to prepare for viewing the eclipse, and – above all – how to do so safely. Certified eclipse viewing glasses were distributed for free to all attendees.

The sun appeared for part of one day during the last week of January. On February 2, we hope that the groundhog will forecast better weather during the next six weeks.

We need to prepare for the eclipse in April, and take advantage of this opportunity, as it will be the last eclipse we'll see around here for many years. The next total eclipse visible in North America will occur on August 23, 2044.

As we did at the library, we will supply eclipse glasses both to our members and to members of the public who attend our observing sessions between now and "Eclipse Day." Eclipse glasses will be available to members and visitors at our monthly meetings in February and March. We'll distribute eclipse glasses, while supplies last, to those who come to our Eclipse Day program at the Moline Public Library.

At our meeting on February 12, we will have a Zoom presentation titled, "Discarded Worlds: Astronomical ideas that were almost correct..." The presentation will be led by Brother Guy Consolmagno, S.J., Director of the Vatican Observatory and President of the Vatican Observatory Foundation.

Our March 11 program will be a business meeting, followed by smorgasbord talks by PAC members. Please consider providing a brief smorgasbord talk for your fellow amateur astronomers; we'd like to hear what you have to share with us.

We have many reasons to hope for clear skies, and to keep looking up this year.

Astronomical League increases membership dues

The Astronomical League has announced an increase in its annual membership dues. The dues increase will take effect on July 1, the beginning of the AL's 2024-25 membership year.

In announcing the increase, the Astronomical League noted that it had last raised its dues in 2006, and that the cost of operating the organization have gone up substantially since then.

All members of the Popular Astronomy Club are also members of the Astronomical League, and AL dues are included with annual PAC membership dues. For clubs like PAC that include all members in the Astronomical League, AL annual dues will be raised from \$5 to \$6. PAC's annual dues will remain unchanged for the time being.

Even with the slight increase, the Astronomical League provides great value to its members. The AL offers a vast array of observing programs; youth and national awards; a library telescope program; outreach support materials; and an informative website that was recently updated. In addition, all Astronomical League members receive Reflector, a quarterly magazine published by the AL.

PAC is a founding member of the Astronomical League, which will celebrate its 78th anniversary this year. Membership in the Astronomical League currently totals more than 23,000, and encompasses more than 300 local astronomy clubs and societies. \checkmark

REFLECTIONS SUMMARY OF PAC JANUARY MEETING

The Popular Astronomy Club held a general membership meeting at the Butterworth Center in Moline on January 8 at 7 p.m.

The meeting was attended in person by 10 PAC members and guests, with another 20 joining the meeting via Zoom.

PAC President Dale Hachtel called the meeting to order. He began the meeting by introducing Andy Bruno, Professor of History and Environmental Studies at Northern Illinois University, who joined via Zoom.

Professor Bruno then gave the feature presentation, titled "The Mystery of the Siberian Explosion: An Environmental History of the Tunguska Event."

The "Tunguska Event" occurred on June 30, 1908, when a large explosion occurred

Destruction from the Sky



"All of a sudden someone shoved our tent strongly. I was scared and screamed...Suddenly I hear someone moan softly. I ran to the voice and saw Ivan. He lay on the ground between the branches of a large tree. His arm had been broken by a log, a bone tore through his shirt and stuck out, and there was dried blood on it. ... Ivan 'woke up,' began to moan louder, and cry. I took off my skirt, tore it up, and wrapped it around ivan's broken arm. Poor Ivan hurt so much that he howled like a wolf, cried, cursed, and screamed."

"All around we saw a marvel (divo), an awful marvel. The forest was not ours. I had never seen such a forest. It was strange in some way. Here we had a thick, dark, and old forest. And now in many places there was no forest at all. On the mountains all the trees lay, it was light, and everything far off was visible. But below the mountains in the bogs, it was impossible to go far: some trees stood, some lay, some were bent, and some had fallen on each other. Many trees were burnt, and the dry undergrowth and moss still were burning and smoking.

The Tunguska Event in 1908 brought down 'destruction from the sky,' as told in these eyewitness accounts.

near the Tunguska River in a remote area of Siberia. The explosion devastated a mostly forested and, fortunately, lightly populated – area of nearly 500 square miles.

Professor Bruno has extensively studied the Tunguska Event, has visited the area where it occurred several times, and is the author of Tunguska: A Siberian Mystery and its Environmental Legacy, which was published by Cambridge University Press in 2022. He began by noting that he approached the event from a historical and environmental perspective, as opposed to a technical angle.

The explosion, which Professor Bruno stated was the "largest of its type known in modern times," was likely caused by a large meteorite. The mystery surrounding the event, he said, is rooted in the fact that few remains of the meteorite have ever been found; also, no large crater resulted, as is often the case with large meteorite strikes.

While it was generally believed at the time that a meteorite caused the explosion, some speculated that it may have been due to a Japanese invasion - just a few years prior, Russia and Japan had been at war. Others thought the explosion may have been caused by internal dissent, which was then racking Russia in the leadup to the Communist revolution that resulted in the creation of the Soviet Union.

The "destruction from the sky," which killed hundreds of reindeer and other wildlife and flattened many trees, was "less severe than it might have been," Professor Bruno said, given the remote location. The few people living in the area were of the indigenous Evenki people, at least one of whom died as a result of the explosion.

The event was largely forgotten until the 1920s, when a meteorite scientist named Leonid Kulik began studying it and mounting expeditions to the Tunguska area. The area was difficult to reach, and Kulik was "undersupplied," Professor Bruno said. At one point, Professor Bruno said, Kulik needed to be rescued from the area, which fueled public and media interest.

Kulik's expeditions continued into the 1930s, Professor Bruno said, and he collected many soil samples, performed geodesic analysis, interviewed evewitnesses, and did an aerial survey. Kulik planned another expedition for 1943; when World War II broke out, though, he joined the Soviet Army. In 1941, Kulik died in a POW camp.

Interest in the Tunguska Event was revived following the war, Professor Bruno said, mostly among better-educated young people in the Soviet Union and elsewhere. The event became a subject Continued on Page 5

January meeting

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of "cosmic fantasies" and fictional accounts, Professor Bruno said.

Science fiction writer Alexander Kazantsev proposed the event may have been caused by the atomic explosion of an alien spaceship, an account which became a "hypothesis" and was the subject of an article in the *New York Times*. It was even speculated that a death ray operated by Nicola Tesla may have been the cause. Later, some wondered if the explosion was caused by antimatter or the Earth's encounter with a black hole.

An entire "distinctive subculture" emerged around the Tunguska Event, Professor Bruno said, as volunteers continued to explore the area. Songs, poems and artwork related to Tunguska were written. Some who went on expeditions were influential members of the Communist Party, while others were believed to be dissidents; all who made the trek dealt with hordes of mosquitos, bad weather, and other privations.

In 1995, several years after the breakup of the Soviet Union, the Tunguska State Nature Reserve was created. The conservation effort will protect the area from economic development – occurring nearby in the form of logging and mining – but, Professor Bruno noted, has also made access to the area more difficult.

Studies still continue, Professor Bruno noted, and it is now widely believed that the Tunguska Event was caused by the airburst explosion of a stony meteorite up to 60 meters in diameter. He said that the lesson of the Tunguska Event may be that we "need to embrace planetary embed-dedness rather than cosmic escapism"; we are part of an environment in which such events can occur.

In response to a question, Professor Bruno said there is little visible evidence of the explosion today, other than the remnants of expeditions and some monuments and markers placed in the area. The forest has regrown, leaving no trace of the devastation seen in 1907.

Following the presentation, Dale noted that a Skywatch article had been published in both the *Quad City Times* and *Dispatch-Argus* that day. The article summarized PAC's public outreach in 2023 and looked ahead to 2024. Dale presented a list of public outreach events currently planned for this year.

Megan Warren said that she had tried out the library telescope won by PAC during last year's Astronomical League convention, and found it to be a "very good telescope" that should be easy to use.

Observatory Director Rusty Case said that PAC was continuing to work on the observatory at the Scout camp at Loud Thunder Forest Preserve and now knew what it needed to do to get the observatory operational by spring.

The meeting adjourned at 8 p.m. A recording of the meeting is available on YouTube via the following link: <u>https://youtu.be/aJOP44OI9wE</u>.

The next membership meeting is scheduled for February 12 at 7 p.m. at the Butterworth Center and via Zoom.



Sheboygan club hosts annual 'Swap n Sell' The Sheboygan Astronomical Society has announced that it will host the 17th annual 'Swap 'n Sell' on Saturday, March 23, from 9 a.m. to 2 p.m. at the Aviation Heritage Center at Sheboygan County Memorial Airport in Sheboygan Falls, Wisconsin. A wide variety of astronomical equipment will be available for sale or barter at the event. More information is available at the club's website: www.shebastro.org

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Let's leap into the February sky

February will be an interesting month, with the sky's brightest stars and constellations well placed for viewing in the southeastern sky.

Very bright Jupiter will be unmistakable to their right (or westward). However, the other planets will be more of a challenge.

Bright Saturn will start February low in the southwestern sky and drop lower each day. It will be lost in the twilight glow by midmonth.

In the predawn sky, Mercury probably will be too close to the Sun to be seen, and brilliant Venus will be dropping lower each day and may be hard to spot by the end of the month. Meanwhile, Mars will be crawling slowly up out of the Sun's glow and during the reign of Julius should be easier to find by the end of the month. Mars and Venus will pass each other on the morning of the 22nd.



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Leap years were first used under the calendar introduced Caesar; in 1582, Pope Gregory XIII reformed that calendar.

February is best known as the shortest month of the year, and the month when a leap day is added every four years (though not always).

February 29 is called a "leap" day because succeeding dates leap over a day of the week. For example, in 2023, March 1 was on a Wednesday, but this year has a leap day, so March 1 leaps over Thursday and falls on a Friday.

A leap day is needed because the Earth takes about 365.25 days to orbit the Sun. Without a leap day, the calendar would drift away from the seasons. Such was the case in ancient Rome, when Julius Caesar developed a calendar that is close to what we have today.

Since the year at that time started in March, he gave March 31 days and alternated the subsequent months with 30 and 31 days. This used 336 days. That left 29 days to be given to the last month, February, with an extra day every four years.

Under Julius Caesar, the start of the year was also moved to January. Everything was fine until the Romans decided to name a month August, after the birth month of Caesar Augustus. That month followed July, which was named for the birth month of Julius Caesar.

Since July had 31 days, it would have been an insult if August had just 30 days. So August was given 31 days, but January was kept at 31 days because of its cultural significance. This gave the calendar 337 days through January, so February was given one less day, or 28, with an extra day every four years.

Unfortunately, the year is about 11 minutes shorter than 365.25 days, so by 1582 the calendar was again getting out of whack. Pope Gregory XIII corrected this by dropping leap days in century years that are not divisible by 400. Thus, while the year 2000 did include a leap day, there will be no February 29 in 2100, 2200 or 2300.

When the move to the Gregorian calendar was made, 10 days were dropped; the day after Thursday, October 4, 1582 was Friday, October 15.

Most Protestant countries resisted using the Pope's calendar, and it took until 1752 for all countries to adopt it. By then, those countries needed to skip 11 days to correct the calendar.

Russia was the lone holdout, staying with the Julian calendar until the Czarist regime was overthrown in 1918. The incoming Bolsheviks immediately adopted the Gregorian calendar, and had to skip 13 days to catch up with the rest of the world.

Some observing highlights for November:

February sky-

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February 4: The Moon will be to the upper right of Antares, the reddish heart of Scorpius (the Scorpion), before sunrise. By the 5th, the Moon will be to the lower left of Antares.

February 6: The crescent Moon will be to the upper right of brilliant Venus and close to its lower right on the 7th. They will be quite low in the sky, so you will need a clear eastern horizon to see them. You may also be able to pick out Mars with binoculars to the lower left of Venus.

February 10: The very thin crescent Moon will be below Saturn, very low in the westsouthwestern sky. Binoculars will help.

February 14: The Moon will be close to the lower right of very bright Jupiter.

February 16: The Moon will be above Aldebaran and close to the lower left of the Pleiades open star cluster in Taurus (the Bull). However, the Moon will probably be too bright, making it difficult to see the Pleiades.

February 20: The bright Moon will be close to the lower right of Pollux, with Castor above in Gemini (the Twins).

February 22: Brilliant Venus will pass much fainter Mars very low in the predawn sky. They will be close from the 20th through the 24th. Start looking about 45 minutes before sunrise. Binoculars may help you see Mars.

February 27: The Moon will be above Spica in Virgo (the Maiden) after rising at about 10 p.m. 禾

David Voigts, Black Hawk Astronomy Club

Winter Football –

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nearly twice the size, and 23 times as luminous, as the Sun.

In contrast, Sirius B is very small and faint. It is only 1/50th the size, and 1/400th as luminous, as the Sun.

Because Sirius A is so much brighter, it is the star we see visually. Sirius B is difficult to see even in a large telescope. Because Sirius B is Sirius A's small companion to Sirius A, it sometimes called "The Pup."

Despite its diminutive size, Sirius B is an amazing object. It is classified as a white dwarf, the burned-out remnant of a star that ran out of hydrogen fuel and collapsed. The material comprising Sirius B is so highly compressed that its atoms have been crushed to an incredibly high density. A walnut-sized chunk of this material would weigh three tons!

The next star in the Winter Football is Procyon, also called "The Little Dog Star" since it resides in the constellation Canis Minor, "The Small Dog." Procyon is the eighth brightest star in the sky and is 11.5 light-years from Earth.

Like Sirius, Procyon is a binary star system. Procyon A and B orbit each other with a period of 40 years. Like Sirius B, Procyon B is a faint white dwarf. Its fate is that of most stars when they run out of hydrogen fuel.

In essence, stars are enormous thermonuclear reactors which generate power by fusing hydrogen into helium. The energy released from the core of the star pushes out against the star's gravity, maintaining a balance which lasts until the fuel is consumed. When the fuel is exhausted, gravity ultimately wins the tug-of-war. This causes the star to collapse, forming a very hot sphere of enormous density.

The pressure formed during a star's collapse is such that even the structure of atoms cannot be maintained. The atoms comprising objects on Earth are almost all empty space – the electrons orbit-

Winter Football

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ing the nucleus can be pictured gnats buzzing around inside a football stadium.

At ordinary pressures and temperatures, these atoms seem solid enough, but inside a white dwarf, that empty space has been compressed down into something truly bizarre and amazing.

Continuing around the winter football, we come to Pollux and Castor. These two bright stars appear very close to one another in both in proximity and brightness, and so appropriately can be found in the constellation Gemini, "The Twins."

Pollux is nine times as big, and 43 times as luminous, as our Sun. It is a giant orange star about 34 light-years distance from earth.

Its twin, Castor, is actually a system of six stars about 51 light-years from Earth that revolve around each other. Can you imagine what it would be like to live on a planet orbiting Castor? It would be an amazing sight to have six suns in your sky.



Aldebaran is both 500 times as luminous as our Sun and much larger; placed at the center of our Solar System, it would encompass the orbit of Mercury.

Capella, the next star in the Winter Football, is also known as "The Goat Star." It resides in the constellation Auriga and is found at top point of the Winter Football.

Look up during February at about 8 p.m., and you'll see Capella almost directly overhead. Capella is the sixth brightest star in our sky, and lies about 43 light-years from Earth. It is also a multiple star system, consisting of four orbiting stars. Two of the stars are golden yellow, and the other two are little red ones. This causes Capella to sparkle and twinkle more than most other stars, making it one of the more beautiful objects in the winter sky.

Going around the periphery of the Winter Football, the next star is Aldebaran. Aldebaran resides in the constellation Taurus, "The Bull," and so is sometimes called "The Bull's Eye."

Aldebaran is an enormous red star as big as the orbit of Mercury. It is 500 times as luminous as the Sun and about 65 light-years from earth.

From our perspective, Aldebaran appears to be embedded in the Hyades, a large star cluster at a distance of 150 light-years from Earth. However, Aldebaran is much closer to earth, and not part of the Hyades cluster. The 250 stars in the Hyades, which is the closest star cluster to Earth, all formed from the same massive cloud of dust and gas.

The final stop on our tour around the Winter Football is the star Rigel, in the constellation Orion, "The Hunter." Rigel is at the bottom of Orion, and is also known the Hunter's "Left Foot."

Rigel is the seventh brightest star in the sky and lies 860 light-years from earth. The fact that we can see Rigel as a bright star at such a tremendous distance tells us it is one of the most luminous objects known in our galaxy.

Rigel is 100 times the size, and perhaps 279,000 times as luminous, as the Sun. It is also very hot, at 21,000°F, and is classified as a supergiant white hot star. Rigel is also very young but, at its present rate of fuel consumption, cannot maintain itself for more than a few million years.

Spring will be here before you know it, so bundle up, get outside, and look up at the Winter Football while you can!

REFLECTIONS

'Almost correct' ideas subject of presentation

A presentation titled "Discarded Worlds: Astronomical Ideas That Were Almost Correct" will be featured at the February membership meeting of the Popular Astronomy Club. The meeting will be held February 12 at 7 p.m. at the Butterworth Center in Moline, and also available online via Zoom.

Brother Guy Consolmagno, SJ, who serves as Director of the Vatican Observatory, will lead the presentation. He will look at the ways observers and astronomers such as Aristotle and Giovanni Schiaparelli came up with ideas that were almost correct, but in fact "were wrong... sometimes hilariously, sometimes heartbreakingly so.

"Astronomy is more than just observing; it's making sense of those observations," Brother Guy said. "A good theorist needs to blend a knowledge of what's been observed, with a good imagination... and no fear of being wrong."

The presentation will look at how the now-discarded images of the universe proposed in the past can provide lessons for today's astronomers.



Brother Guy Consolmagno serves as Director of the Vatican Observatory.

A native of Detroit, Michigan, Brother Guy holds both Bachelor and Master of Science degrees in Planetary Science from the Massachusetts Institute of Technology, and a Doctorate in Planetary Science from the University of Arizona.

After earning his doctorate, Brother Guy returned to MIT as a postdoc fellow and lecturer. He then spent two years in the Peace Corps, teaching physics and astronomy in Kenya, and later became an assistant professor at Lafayette College in Easton, Pennsylvania.

Brother Guy joined the Jesuit Order in 1989 and took his vows in 1991. He was assigned to the Vatican Observatory in 1993.

Brother Guy is the coauthor of two astronomy books, and the author or coauthor of four books exploring issues of faith and science. He has published numerous articles in astronomical journals and publications and writes a column for *The Tablet*, a monthly magazine covering international Catholicism.

Brother Guy's astronomical research is focused on the connections between meteorites and asteroids, and the origin and evolution of small bodies in the Solar System. He was a member of a National Science Federation team that went to Antarctica in 1996 to collect and analyze meteorites.

New priority stamps feature Webb Telescope images



The U.S. Postal Service has issued two new Priority Mail stamps featuring images that were taken by the James Webb Space Telescope.

A \$9.85 Priority Mail stamp displays an image of the "Pillars of Creation" taken by the JWST in 2022. It depicts a formation found within the Eagle Nebula where new stars

are being born.

A \$30.45 Priority Mail stamp displays an image of the "Cosmic Cliffs," a highly energetic area within the Carina Nebula where new stars and planets are taking shape.

Both stamps are being sold in panes of four, and can be used to send items with a guaranteed delivery of two days or less. These and other stamps can be purchased through the USPS online store, at <u>usps.com/shopstamps</u>, and at local post offices. \checkmark

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PAC at the Moline Public Library

The Popular Astronomy Club appeared at the Moline Public Library on January 29 for a presentation given under the library's 'Project Next Generation' program. Dino Milan demonstrated how telescopes and the eyepieces used on scopes work, while Dale Hachtel discussed the upcoming solar eclipse and how a 'Sunspotter' could be used to safely view the eclipse. Al Sheidler also discussed the wonders to be found in the 'Winter Football' (see page 1). PAC's next presentation at the library is scheduled for March 20.



Other Suns: Epsilon (8) Monocerotis

How to find Epsilon Monocerotis on a February evening

Face south. Look for the Winter Triangle stars of Betelgeuse and Procyon. Epsilon Monocerotis is about 1/3 between Betelgeuse and Procyon. It is a 4.3 magnitude star so dark skies are needed to spot it.

Epsilon (8) Mon A-B separation: 12 sec

A magnitude: 4.4 B magnitude: 6.6 Position Angle: 29° Colors: white lilac



REFLECTIONS

Circumpolar constellations: Our constant companions

Winter in the Northern Hemisphere offers many crisp, clear (and cold!) nights for stargazers, along with better views of several circumpolar constellations.

What does circumpolar mean when referring to constellations? This word refers to constellations that surround the north and south celestial poles without ever falling below the horizon.

Depending on your latitude, you may be able to see up to nine circumpolar constellations in the northern hemisphere. Today, we'll focus on three that have gems within: Auriga, Cassiopeia, and Ursa Minor. These objects can all be spotted with a pair of binoculars or a small- to medium-sized telescope.



This map shows the location of three interesting objects found in circumpolar constellations.

The Pinwheel Cluster: Located near the edge of Auriga, this open star cluster is easy to spot with a pair of h

Auriga, this open star cluster is easy to spot with a pair of binoculars or small telescope. At just 25 million years old, it contains no red giant stars and looks similar to the Pleiades.

To find the Pinwheel Cluster, draw a line between the stars Elnath in Taurus and Menkalinan in



_ Auriga. You can also find the Starfish Cluster nearby.

The Owl Cluster: Located in the "W" or "M" shaped constellation Cassiopeia is the open star cluster known as the Owl Cluster. Sometimes referred to as the E.T. Cluster or Dragonfly Cluster, this group of stars never sets below the horizon and can be spotted with binoculars or a small telescope.

Polaris: Did you know that Polaris is a triple star system? Look for the North Star on the edge of Ursa Minor; with a medium-sized telescope, you should be able to separate two of the three stars.

This star is also known as a Cepheid variable, meaning that it varies in brightness, temperature and diameter. It's the closest one of its kind to Earth, making it a great target for study and conceptual art.

There is indeed more to Polaris than meets the eye; to learn more about the North Star, go to this link on the NASA website: <u>Polaris.</u> \checkmark

Kat Troche

This article is courtesy of NASA's Night Sky Network program, which supports astronomy clubs and is dedicated to outreach. Visit <u>nightsky.jpl.nasa.gov</u> to learn more.



The best-known circumpolar 'constellation' of all is undoubtedly the Big Dipper, actually an asterism in Ursa Major. This familiar group of stars goes by many names in other cultures. Residents of the United Kingdom often refer to it as the 'Plough' (Plow), or sometimes the 'Butcher's Cleaver.' In Germany and Nordic nations, the asterism went by the name 'Odin's Wain,' i.e. the wagon of the war god. In the Netherlands, the Dutch refer to it as the 'Saucepan,'; in Lithuania, it's sometimes referred to as the 'Bucket.'

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Byron Davies got out in late December to capture these images of IC-405 (the Flaming Star Nebula) and NGC-2024 / IC-434 (the Flame Nebula / Horsehead Nebula). We look forward to seeing more of Byron's great work!



Former PAC member Mike Mack, now living in Wisconsin, shared these images of M42 (the Orion Nebula), taken using different filters and then processed. We invite Mike to send more of his outstanding astrophotos!



FEBRUARY 2024 REFLECTIONS PAGE 14

FEBRUARY 10: Quad Cities Astronomical Society Public Night, Menke Observatory, sunset at 5:29 p.m.

FEBRUARY 12: Monthly membership meeting at Butterworth Center / via Zoom; 7 p.m. Program: "Discarded Worlds: Astronomical Ideas That Were Almost Correct" by Brother Guy Consolmagno, Director of the Vatican Observatory

MARCH 11: Monthly membership meeting at Butterworth Center / via Zoom; 7 p.m. Program: Business meeting / Smorgasbord of member presentations

MARCH 16: Public observing at Niabi Zoo (first of season); sunset at 7:12 p.m. Niabi Zoo public observing sessions held on third Saturday of the month through November

MARCH 20: Moline Public Library; "Project Next Generation" presentation on solar eclipse, 7 p.m.; night sky observing follows

APRIL 4: Eclipse presentation at Rock Island Public Library, Watts Midtown Branch, 7:30 p.m.; night sky observing follows

APRIL 8: Eclipse viewing at Moline Public Library; partial eclipse peaks at approximately 2 p.m.

APRIL 8: Monthly membership meeting at Butterworth Center / via Zoom; 7 p.m. Program: "Solar Flares and Neptune's Chemistry" by Robert Gregory, Astronomy Professor, Scott Community College

MAY 13: Monthly membership meeting at Butterworth Center / via Zoom; 7 p.m. Program: "Keep Looking Up - One Sky, One World " by Dave Weinrich, former Director of Minnesota State University-Moorhead Planetarium

JUNE 24: 'Stars & S'mores' public observing session at Scott County Public Library, Eldridge, 8:30 p.m.; June 27 rain date

JUNE 29: Public observing session at Illiniwek Campground; July 6 rain date

JULY 11: Public observing session at Silvis Public Library; celebrating library's centennial; July 18 rain date

AUGUST 10: Annual PAC Picnic / Perseid meteor shower observing, Paul Castle Observatory

OCTOBER 12: Annual PAC Banquet; time / place to be determined

Events subject to change; check your email for updates

Astronomical League seeks candidates for treasurer

The Astronomical League is seeking candidates willing to serve as the organization's new treasurer. The treasurer is responsible for managing the Astronomical League's cash flow and budgeting, and handling financial accounting and reporting, including filing the annual IRS 990 report.

Desired qualifications include an understanding of accounting rules and procedures, strong analytic skills, and an ability to explain financial matters in an understanding manner. Those interested should contact Astronomical League President Carroll Iorg, at president@astroleague.org.