The Prairie Astronomer

November, 2025 Volume 66, Issue #11

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THE NEWSLETTER OF THE PRAIRIE ASTRONOMY CLUB

The Prairie Astronomer

David Woolf, Kalamazoo, MI at NSP 2018
Photo by Mark Dahmke

Next meeting: Tuesday November 25th 7:30pm at Hyde Observatory

NEXT MEETING

How to Buy a Telescope

If you're considering buying a telescope for a family member for Christmas, the Prairie Astronomy Club will offer assistance with a session on "how to buy a telescope" at the November meeting. Experienced amateur astronomers will talk about how to select a telescope and what to look for when making your purchasing decision.

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Cover: Orion Nebula and Horsehead/Flame by Brett Boller

M31 by Brett Boller

Most of our club meetings are held at Hyde Memorial Observatory in Holmes Park.

The Observatory is owned and maintained by the City of Lincoln Parks and Recreation Department, but is operated by volunteers, many of whom are also members of the Prairie Astronomy Club.

CALENDAR

November PAC Meeting
Tuesday, November 25th, 7:30pm Hyde Observatory
Program: How to Buy a Telescope

December: Holiday Gathering

January PAC Meeting
Tuesday, January 27th, Hyde Observatory

February PAC Meeting
Tuesday, February 24th, Hyde Observatory

PAC Google calendar:
https://www.prairieastronomyclub.org/event-calendar/

2026 STAR PARTY DATES

	Date	Date
January	9	16
February	13	20
March	13	20
April	10	17
May	8	15
June	5	12
July	10	17
NSP	7/12-7/17	
August	7	14
September	4	11
October	2	9
November	6	13
December	4	11

Underlined Dates are closest to the New Moon.

CLUB OFFICERS

President	Jason O'Flaherty jflaher@gmail.com
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2nd VP (Program Chair)	Amos Sobotka asobotka64@gmail.com
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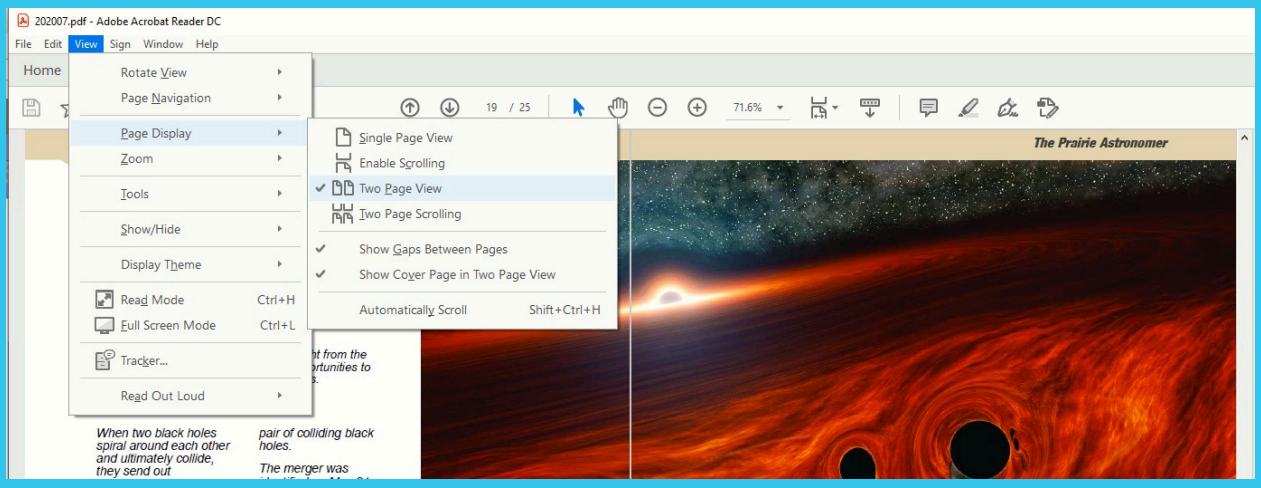
NOTICES

Newsletter Page View Format

How to Adjust Adobe Acrobat Settings for Two Page View



To view this newsletter in magazine spread format in Acrobat, select View ->Page Display->Two Page View. Acrobat will then show two pages side by side. Also make sure the checkboxes "Show Cover Page in Two Page View" and "Show Gaps Between Pages" are checked. If you have it setup correctly, the cover page will be displayed by itself and subsequent pages will be side by side with the odd numbered pages on the left.

Pay Dues

https://www.prairieastronomyclub.org/pay-dues-online/
If you're already a member and are renewing within 30 days of your anniversary date, select the early renewal option for a discount.

PAC-LIST

Subscribe through GoogleGroups or contact Mark Dahmke to be added to the list. You'll need a Google/ gmail account, but if you want to use a different email address, just associate that address with your google account to access Google Groups. Once subscribed, you can view message history through the GoogleGroups website. To post messages to the list, send to this address: pac-list@googlegroups.com

The President's Message

Dear PAC Members,

I want to begin by thanking everyone who joined us for our October meeting at the Branched Oak Observatory. It was wonderful to see so many people make the trip out in person, and we greatly appreciate Branched Oak for hosting us once again. I'd also like to extend a thank you to Amos Sobotka for his excellent presentation on Cartography of Extraterrestrial Objects. It was a joy to see him share a topic he's so passionate about.

I'm deeply honored to have been re-elected as your President of the Prairie Astronomy Club. I am continually humbled that you continue to place your trust in me. I'll do my best to lead our organization with the same dedication and sense of community that makes PAC such a special group.

Looking ahead, our next big event will be the "How to Buy a Telescope" class on Tuesday, November 25th at 7:30 p.m. This event will replace our usual club meeting and serves as one of our most valuable opportunities to give back to the public. A Facebook event has already been created, and we'll be running ads and posting flyers at local libraries to help spread the word. Please share the event with anyone interested in astronomy and come lend your support to our presenters during the class to help answer questions or assist attendees who are just beginning their journey into the night sky.

I'm also finalizing the details for our December Holiday Party this week. I will send out the official invitation as soon as possible so that you can mark your calendars. This get-together is always one of my favorite events of the year. It's a great time to relax, celebrate, and enjoy good company as we wrap up another season of astronomy together.

As we enter the holiday season, I want to wish each of you warmth, joy, and clear skies. Thank you for making the Prairie Astronomy Club such a welcoming and inspiring community.

Clear skies,

Jason O'Flaherty

Meeting Minutes

Jim White

Tonight's meeting is being held at BOO (Branched Oak Observatory) and online via Zoom. Jason started the meeting at 7:30. We had one visitor at tonight's meeting, Jackson Littrell, Rick Littrell's grandson.

At 7:32 Jason turned the meeting over to Jim Kvasnicka, PAC Observing Chair, for his November observing report. November's star parties are scheduled for the 14th and the 21st at the Clatonia Recreation Area, approximately 1 ½ miles north of Clatonia. Planets for November, Mercury will be visible in the morning after November 20th, Saturn is in Aquarius at magnitude +0.9 with a disc that is 18.5 arc seconds wide, Neptune and Uranus are in Taurus and Pisces, Venus is a morning planet with a magnitude -3.9, Jupiter is a magnitude -2.3 in Gemini and its disc is 42.3 arc seconds wide and Mars will not be visible in November. There is one meteor shower in November, the Leonid's, it will peak the night of the 17th and 18th and you can expect up to 15 per hour and the moon will not be interfering. The Leonid's are known for producing large fireballs so you may get lucky and see one. Jim's complete report can be found in this newsletter. Jim finished his report at 7:35 and turned the meeting back over to Jason.

Jason is giving John Reinert's treasures report tonight. John reported that the club's accounts increased slightly and that eight members were dropped due to non-payment of dues. John gives a people a very generous grace period to get their dues paid. Jason finished John's report at 7:36.

Club business for tonight is election of officers. Jason has not heard from anyone wanting to make additional nominations since our last meeting so he gave a few moments for anyone to make additional nominations for officer's before nominations are closed. There were no new nominations made and there was a motion to close nominations and the motion was seconded and nominations were closed.
Nominations for officer's were:
President – Jason O'Flaherty
First Vice President – Brett Boller
Second Vice President – Amos Sobotka
Secretary – Jim White
Treasurer – John Reinert
All persons nominated for office were unanimously elected. Elections were closed and we have our board for the next year.
The program for our November meeting on Tuesday the 25th will be our annual "How to Buy a Telescope" program.

Meeting Minutes, continued

In place of our December meeting, we will have our annual holiday party and are targeting Tuesday December 16th at Big Red Restaurant, hopefully we will have this confirmed by our November meeting. The meeting for January 27th will not be our usual "How to Use Your Telescope", we want to move it to a little later in the late winter/early spring where we can hopefully have some better weather than what we tend to get in January. For now, the plan for our January meeting is to have it at BOO, since Hyde will likely be closed for some upcoming renovation work. From what we know so far Hyde will probably be closed thru April.

Volunteer opportunities: Hyde is always looking for volunteers and PAC is one of the main suppliers of volunteers for Hyde. For more information go to https://www.hydeobservatory.info/volunteer/

Nocturnal November will be happening on November 15th at the Spring Creek Prairie Audubon Center by Denton, if you are interested in volunteering reach out to Don Hain.

There was no other new business so the meeting was adjourned at 7:41.

Tonight's Program is "Cartography of Extraterrestrial Objects, A Mapping Tour of our Solar System" presented by club member Amos Sobotka.

Don Hain sent these photos, taken at Nocturnal November at Spring Creek Prairie on November 15.

ARP 86

The Mantrap Skies Image Catalog

Arp 86 is a pair of interacting galaxies in Pegasus, just north of the Great Square. It is about 220 million light years distant. To appear this large at that distance means it is a very large spiral galaxy. 225,000 light-years across including plumes. Arp put it in his class; "Spiral Galaxies with Companions on Arms: Large High Surface Brightness Companions. The companion certainly has a high surface brightness. I had to process it separately to prevent it from burning in as I stretched the image.

Arp's comment on this entry was: "Double arm leading to companion." This shows better in his image than mine. Probably due to his blue emulsion picking out new, massive stars that define arms and ignores older, smaller stars as shown by how dimly he picked up the core of the galaxy which is quite red and the seeing atop Palomar mountain being better than I have atop my little hill above the lake. Where are those laminar air flow mountains when you need them in this state?

The big spiral is NGC 7753 which is

Rick Johnson

Rick Johnson, a founding member of the Prairie Astronomy Club, passed away in January, 2019. His legacy lives on through his comprehensive catalog of over 1600 images at www.mantrapskies.com.

ARP 86, continued

classed as SAB(rs)bc. The companion is NGC 7752 which is classed is I0? with strong HII emission lines. It seems to contain three main clumps arranged randomly. Notes at NED can't agree on it. One says; "This is a blue galaxy as indicated by the color profiles." But another says; "Compact elliptical red object which, with the spiral galaxy NGC 7753, constitutes a M51-type system." So is it red or blue? It is rather white in my image with some hint of red at the west end. I'm wondering if the HII emission features are causing this discrepancy. Another avoids the issue saying; "Very small and bright. Peculiar." No one would argue that. To my eye, the tidal arm from 7753 passes behind 7752 but isn't seen on the other side.

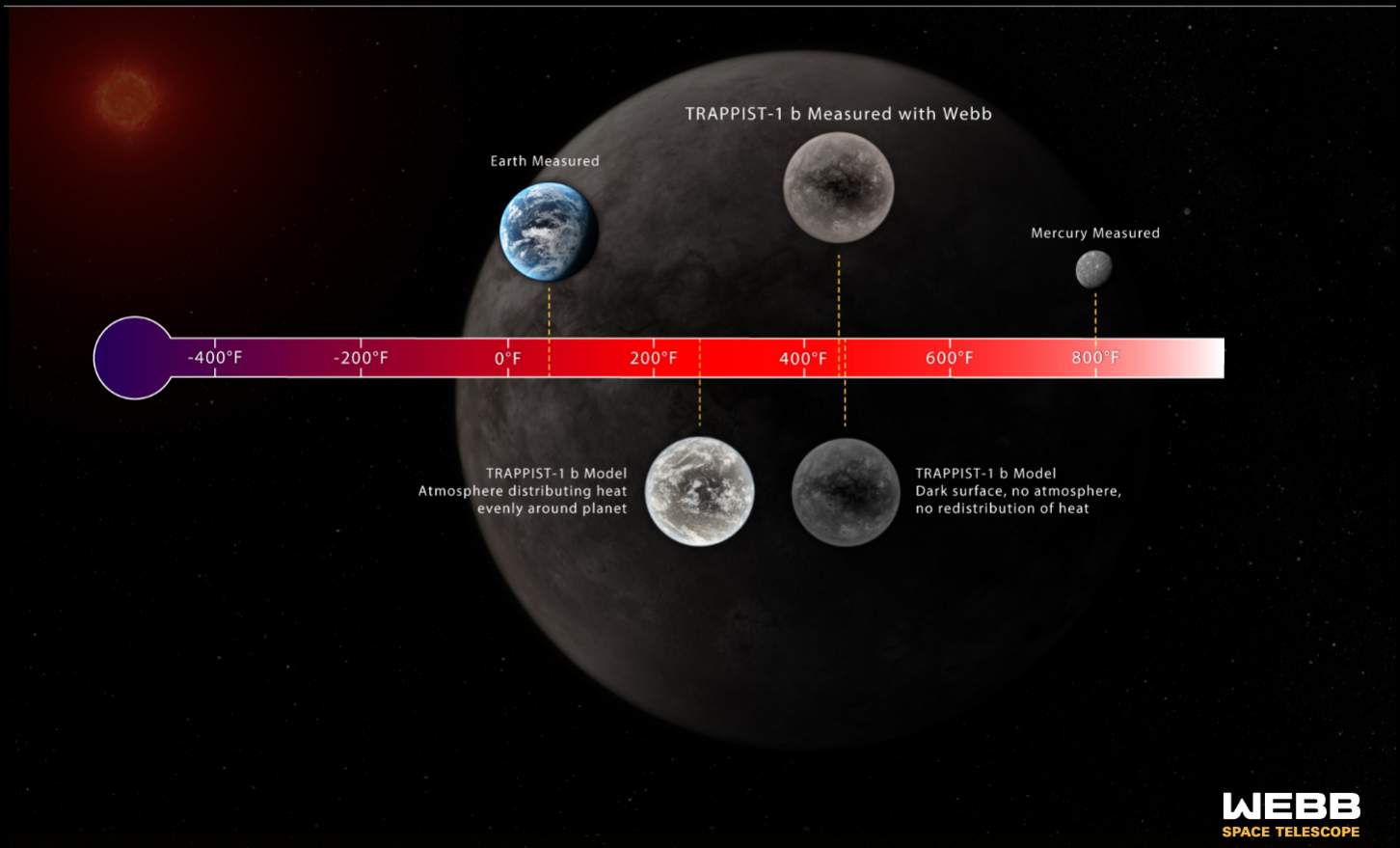
NGC 7752 was discovered by R. J. Mitchell on November 22, 1854. NGC 7753 was discovered by William Herschel on September 12, 1784. It isn't in either of the Herschel 400 observing programs.

The rest of the field is little studied. The Sloan survey didn't include this area of the sky. A few distant red galaxies are in the field. Most are found in the 2MASS survey but without any distance data. The small elliptical below NGC 7753 is 2MASX J23470758+2926531. I find nothing on it or any other galaxy in the image.

The field appears noisy. At first, I thought I'd done something very wrong in my processing or else there were thick clouds in the area I didn't know were around. But after deeply stretching the POSS II plates I saw this was due to the Integrated Flux Nebula being weakly in the field. I found few images of this one on the net and none, not even one by Adam Block then at Kitt Peak show it that I found. If I'd have realized it was there I'd have put more time into it to better bring out the IFN. There's always next time.

ROCKY EXOPLANET TRAPPIST-1 b

EFFECT OF ATMOSPHERE ON DAYSIDE TEMPERATURE



Researchers can determine whether or not a tidally locked rocky planet has an atmosphere by comparing its measured temperature to computer models. In this example, the dayside temperature of the rocky planet TRAPPIST-1 b measured using Webb is very close to the model temperature that assumes the planet has a dark surface and no atmosphere. If the planet did have a substantial atmosphere carrying heat around the planet, the dayside would be significantly cooler, and Webb would have detected less mid-infrared light. TRAPPIST-1 b, which orbits a red dwarf star 40 light-years from Earth, is not part of the Rocky Worlds program. Credit: Illustration: NASA, ESA, CSA, Joseph Olmsted (STScI), Andi James (STScI); Science: Thomas Greene (NASA Ames)

Focus on Constellations: Perseus

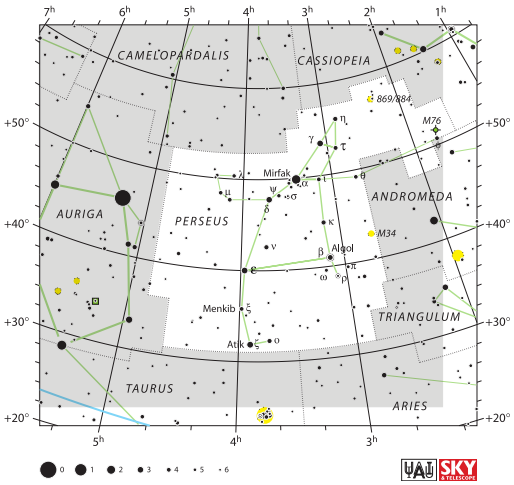
Jim Kvasnicka

Perseus the Hero lies in the Milky Way and is rich in such typical Milky Way objects as open clusters and diffuse nebulae. Perseus has two Messier objects, open cluster M34 and the planetary nebula M76. Both are fine sights but the most outstanding object in Perseus goes to the Double Cluster, NGC 869 and NGC 884. The constellation Perseus is best seen in December.

Showpiece Objects
Open Clusters: M34, NGC 869 and NGC 884 (The Double Cluster)
Planetary Nebulae: M76 (The Little Dumbbell)
Double Stars: Theta Persei, Eta Persei (Miram)
Variable Stars: Beta Persei (Algol)

Mythology
Perseus slew the Medusa, the snake haired Gorgan. Anyone who looked at Medusa would turn into stone. Perseus got around this problem by not looking directly at her. He did this by looking at her reflection in his shield. He killed the Medusa by cutting off her head. Some of her blood fell into the sea and mixed with sea foam out of which sprang Pegasus the white winged horse. Later while riding Pegasus he came across Andromeda chained to the rocks on the sea shore as a sacrifice to the sea monster Cetus. Perseus was able to kill the Cetus by pulling the head of the Medusa from a bag and holding it up to Cetus. The monster looked at the head of Medusa and was turned into stone.

Number of Objects Magnitude 12.0 and Brighter
Galaxies: 9
Open Clusters: 19
Planetary Nebulae: 1
Bright Nebulae: 1
Dark Nebulae: 1



Andromeda Constellation Map: IAU and Sky & Telescope magazine (Roger Sinnott & Rick Fienberg), CC BY 3.0 <https://creativecommons.org/licenses/by/3.0>, via Wikimedia Commons

December Observing

Jim Kvasnicka

This is a partial list of objects visible for the upcoming month.

Planets
Venus: Not visible.
Mercury: Morning planet.
Mars: Too close to the Sun to be visible.
Jupiter: In Gemini at magnitude -2.4 with a disk 45.19" wide.
Saturn: In Aquarius at magnitude +1.1 with a disc 17.73" wide.
Uranus and Neptune: In Taurus and Pisces.

Meteor Showers
Geminids: Peaks the night of December 13-14, the Moon will not interfere. The waning crescent Moon rises around 2:30 am. Expect up to 150 per hour from a dark site.

Messier List
M2: Class II globular cluster in Aquarius.
M15: Class IV globular cluster in Pegasus.
M29: Open cluster in Cygnus.
M31: The Andromeda Galaxy.
M32/M110: Companion galaxies to M31.
M39: Open cluster in Cygnus.

Last Month: M27, M30, M56, M57, M71, M72, M73
Next Month: M33, M34, M52, M74, M76, M77, M103

NGC and other Deep Sky Objects
NGC 578: Elongated galaxy in Cetus.
NGC 779: Elongated galaxy in Cetus.
NGC 869/884: The Double Cluster in Perseus.
NGC 972: Galaxy in Aries.
NGC 1187: Galaxy in Eridanus.

Double Star Program List
Eta Cassiopeiae: Yellow primary with a rose-colored secondary.
Sigma Cassiopeiae: Yellow and light blue stars.
Theta Aurigae: Bright white and pale blue pair.
1 Camelopardalis: White and pale blue stars.
32 Camelopardalis: Equal white pair.
Gamma Ceti: White primary with a pale-yellow secondary.
Chi Tauri: White primary with a pale blue secondary.
118 Tauri: White and yellow stars.

Challenge Object
NGC 697 Galaxy Group: Group of six galaxies in Aries that include NGC 678, NGC 680, NGC 691, NGC 694, NGC 695, and NGC 697.

Club Outreach

Don Hain
dhain00@gmail.com
402-440-5318

The Crete Public Library and their friends group sponsored a stargazing event on Wednesday, November 12th. Advertised as follows:

Bring the whole family for a fun night of stargazing at the library. We'll have telescopes, binoculars, and plenty of fascinating facts about the night sky. Don't forget a blanket or lawn chair to relax while you look up!

... the evening pulled in 25 to 30 folks. The event took place in the Crete Carrier Community room that is attached to the library. Folks were introduced to both refractor and reflector telescopes, including a 254mm be 1200mm dobsonian that caused some of the youngsters to exclaim it was the biggest scope they had ever seen. A lego orrery of the sun-earth-moon system was used to springboard into discussion of early astronomy. The talk ended with a quick overview of Stellarium. The group then went outside. The night was a bit cloudy so the view of Saturn was not as clear as had been hoped, but it was clear enough to see the handle of the Big Dipper and to point out the Summer Triangle. The evening ended by viewing the Pleiades through the library's very own tabletop dob (114mm x 450mm). One of the teenaged patrons guided the Seven Sisters into view after several others had noticed them showing in the northeast above the clouds. It was a great evening. Perhaps this can be the start of a connection to build on. OAS was also in on the event, in that while my wife and I are waiting for our new home to be finished in south Lincoln, we are living close to Mike Modrcin of OAS, and I borrowed a few scopes from him.

Nocturnal November (previously Hoot 'n' Howl) is the fall activity held at Spring Creek Prairie. This year it fell on Saturday, 11/15. That put it into standard time, so we had an hour+ extra darkness compared to what the previous mid-October dates give us. The Pleiades and Summer Triangle were the objects I spent time pointing folks to. David Dickinson supplied folks with a chance to view things digitally using his Unistellar eVscope 2 and the Celestron Origin he has. The evening was a great success. Hopefully some of us can participate again next year.

Jupiter is currently keeping company with the Gemini twins, and rises in the northeast a bit later in the evening than the Pleiades. I am looking forward to

Club Outreach

following Jupiter's path among the stars as we work our way through the winter months. I hope you have some chances to exchange thoughts about the marvelous sight the stars and other objects provide us with in the winter skies with your neighbors and friends. Keep warm and keep looking up!

Upcoming event(s):

Tuesday November 25th at 7:30pm - How to Buy a Telescope
(internally organized meeting for outreach. … For those new to astronomy / wanting to learn more about it)

Per the description on the PAC website: If you're considering buying a telescope for a family member for Christmas, the Prairie Astronomy Club will offer assistance with a session on "how to buy a telescope" at the November meeting. Experienced amateur astronomers will talk about how to select a telescope and what to look for when making your purchasing decision.

Cosmos and Cocktails: Animal Mating Rituals When: Saturday, February 14, 2026, 6 to 9 PM; Where: Nebraska State Museum and Planetarium; Needs: we did not commit to this, but you are welcome to join in the festivities (there is a cost associated) - Perhaps we could discuss the mating of hydrogen atoms/nuclei … churning out young 'uns of helium to folks coming by a booth ???

Lied Lodge - Project Learning Tree, When: March 22-24, 2026 (which day is still unknown); Where: Lied Lodge; Sponsored by: Project Learning Tree | Sustainable Forestry Initiative, Inc. Needs: volunteers to help with a star walk or stargazing activity. See https://www.plt.org/ and www.forests.org

Astronomy Night, When: Saturday, April 11, 2026 5 to 9 PM, Where: Nebraska State Museum and Planetarium. Needs: volunteers at the PAC table(s) - displaying and talking with folks about an astronomy related topic

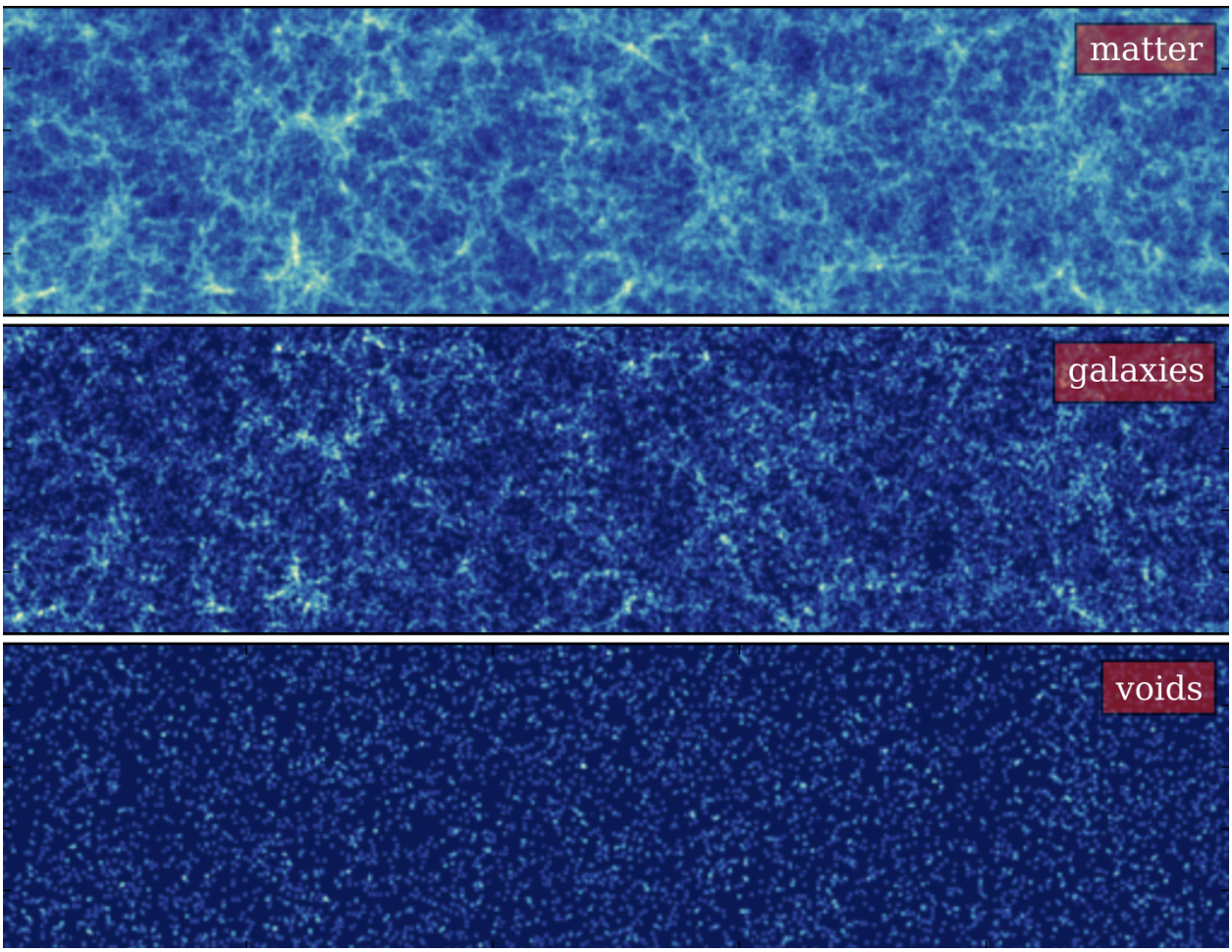
Hyde Observatory: OPEN
When: Saturday nights,
Needs: volunteers willing to work out on the deck or manage the shows in the classroom about one Saturday per month

See https://www.hydeobservatory.info/volunteer/ for more information

See https://forms.gle/ZKr4ivapvUhfejwL6 for the volunteer form to get paperwork with the city started. Since Hyde offers the activity through city government a background check is needed. Submission of this form will get that going.

Are The Cosmic Voids Truly Empty?

Paul Sutter
Reprinted from: Universe Today



If we take out all the matter, neutrinos, dark matter, cosmic rays, and radiation from the deepest parts of the voids the only thing left is empty space. I know it sounds like a paradox but the voids are full of the vacuum of space-time. And crucially, that's not nothing.

That's because the vacuum of space-time has something inside of it. Or on top of it. Or within it. Or kind of existing within its fundamental fabric. Look it's kind of hard to precisely describe with words what's going on but I'm talking about the quantum Fields. In quantum field theory the particles that make up our existence like electrons and top quarks and neutrinos and even the dark matter aren't really particles. What we think of as a particle is

Cosmic Voids, continued

really just a manifestation of a deeper more fundamental object. These objects are the fields. There's a field associated with every kind of particle and these fields completely soak every cubic centimeter of space and time. They have existed since the big bang and they completely fill up every corner of the universe.

When we point to something and say oh look at that electron zooming by what we're really seeing is an excitation or a vibration or a wave of the fundamental field that has cohered and is traveling. But even if you take out all the particles even if you take out all the stuff the field itself remains .

And that field has energy. It has energy through the Heisenberg uncertainty principal which is a whole other episode. And when we go to calculate how much energy is in the vacuum we get answers anywhere from an extreme amount of energy to literally an infinite amount of energy…which is also another episode. But this energy has an effect. we call the effect of this energy "dark energy" which is the cool name we give to the accelerated expansion of the universe.

Now we know from dark energy and the rate of acceleration that we can measure in the universe that the actual amount of energy in the vacuum is not very large. But it's not zero. And the thing about dark energy or vacuum energy or whatever you want to call it is that in dense places in the universe it doesn't matter. It has no effect. Here on the earth there's a lot of density of matter and that presence of matter completely overwhelms any effect that dark energy might have. You could erase dark energy from existence totally all together and we here on the Earth would never notice. Trajectories of thrown baseballs would be exactly the same. your burrito would still take the same amount of time to cook in the microwave. Nothing changes.

The same is true for galaxies. The same is true for clusters. The same is true for filaments. The same is true for walls. The same is true for every part of the cosmic web. Except for the voids. The voids are the places where matter isn't. The voids are places where the vacuum of space-time itself dominates. If you put yourself in the middle of a cosmic void you are surrounded by dark energy .

In fact voids are the places where dark energy is doing its job of accelerating the expansion of the

Cosmic Voids, continued

universe. It's not happening in any dense places like galaxies or clusters. It's only happening in the voids. The voids don't just empty out to build the cosmic web. the voids themselves are expanding. They are literally tearing the cosmic web apart. What we see as these very large and beautiful and intricate structures in the universe are temporary. Over the course of the next 5-10-20 billion years the exact number doesn't matter the cosmic web is going to evaporate. And it will do that through the action of the voids pressing against everything else.

So the voids are full. They are vibrating with fundamental quantum energies. They are doing work on the rest of the universe to accelerate its expansion. And they are the only places in the universe that can do this, and the only reason they can do this is because they are devoid of everything else.

So yes voids are empty of matter. this is how we discover them. this is how we measure them. this is how we define them. But the emptiness of matter means that they are full of dark energy. And so no matter where you go in the universe whether it's to a nearby Galaxy or the deepest interior of the emptiest void, you will never ever quite be alone.

Is it aliens? Why that's the least important question about interstellar objects

Laura Nicole Driessen
Postdoctoral Researcher in Radio Astronomy, University of Sydney
Reprinted from: The Conversation

On October 29, Comet 3I/ATLAS reached its closest point to the Sun.

This point, known as perihelion, was around 210 million kilometres from the Sun, or 1.4 times the distance between the Sun and Earth, and it was on the opposite side of the Sun to Earth. This means the Sun has been blocking the comet from our view (from Earth). There are already reports it's been detected again using ground-based telescopes.

The comet is the third interstellar object (hence the "3I") we've detected flying through our Solar System.

Aliens, continued

When it was first detected on July 1 2025 by the Asteroid Terrestrial Last Alert System (or "ATLAS"), one of the first questions people asked was "but is it aliens?".

This isn't the first time the alien question has come up in the context of a new astronomical discovery. But although it might be fun, it can also detract from the real (and very cool) science, and fuel misinformation.

A long history of speculation

Similar alien speculation arose when the first two interstellar objects were discovered: 1I/2017 U1 'Oumuamua and Comet 2I/Borisov.

And it doesn't just happen for interstellar objects.

In 2019, I wrote my first public article about a discovery I made as a PhD student. I had found radio light coming from a binary star system, the first object found by the MeerKAT telescope to be changing brightness over time. Even though this had nothing to do with aliens, the editor asked me to include speculation about them.

In 1967, Jocelyn Bell Burnell, then a PhD student, discovered a rapidly repeating flash of radio light.

As a joke, she labelled it LGM 1 for "Little Green Men", but the astronomers working on it did not really believe they had discovered aliens. They were, however, concerned about the possibility that alien-related media coverage would sensationalise the discovery and hinder their scientific investigations.

A 7 billion-year-old visitor

This concern remains for astronomers today.

Comet 3I/ATLAS is possibly the oldest thing we've ever seen in our Solar System. Our Solar System formed 4.6 billion years ago, while recent research points to Comet 3I/ATLAS possibly being more than 7 billion years old.

It has spent a lot of that time zipping through the universe just to spend a few months in our Solar System. When the comet reached perihelion, that's probably the closest it's been to a star in at least millions of years.

Research has shown the comet has more carbon dioxide in its outer layers than has been seen in most comets in our Solar System. It also has a higher ratio of nickel to other elements than has been seen in local comets.

These chemical signatures give us a unique insight into the chemical composition of the cloud of gas that formed the solar system where the comet came from.

Aliens, continued

This is one of the key reasons why we should only be asking about aliens when all other possibilities are exhausted. When we talk about aliens first, we might miss all this amazing information.

As astronomer Carl Sagan said (in his rewording of a principle by French mathematician Pierre-Simon Laplace), "extraordinary claims require extraordinary evidence". It's true we can't completely explain every detail of the comet yet, but not knowing everything is not evidence of aliens.

Embrace the uncertainties

Talking about aliens also leaves room for misinformation to spread.

For example, there have been claims of things such as trajectory shifts and Comet 3I/ATLAS "hiding" behind the Sun. Despite no evidence to support this, I received many questions along these lines when I spoke about the comet online. This demonstrates how easy it is for misinformation to be generated and spread when we're talking about "aliens".

There are ways to see the comet while it's on the other side of the Sun. For example, the European Space Agency plans to observe the comet using the Mars Express, ExoMars Trace Gas Orbiter and the Jupiter Icy Moons Explorer.

And if you'd like to see the trajectory of Comet 3I/ATLAS and find out where it is right now, you can.

There might be something to be learned from poets here. Romantic poet John Keats wrote about something he called "negative capability". It's a strange name, but the concept is about being able to sit with "uncertainties, mysteries and doubts" and be content with not knowing.

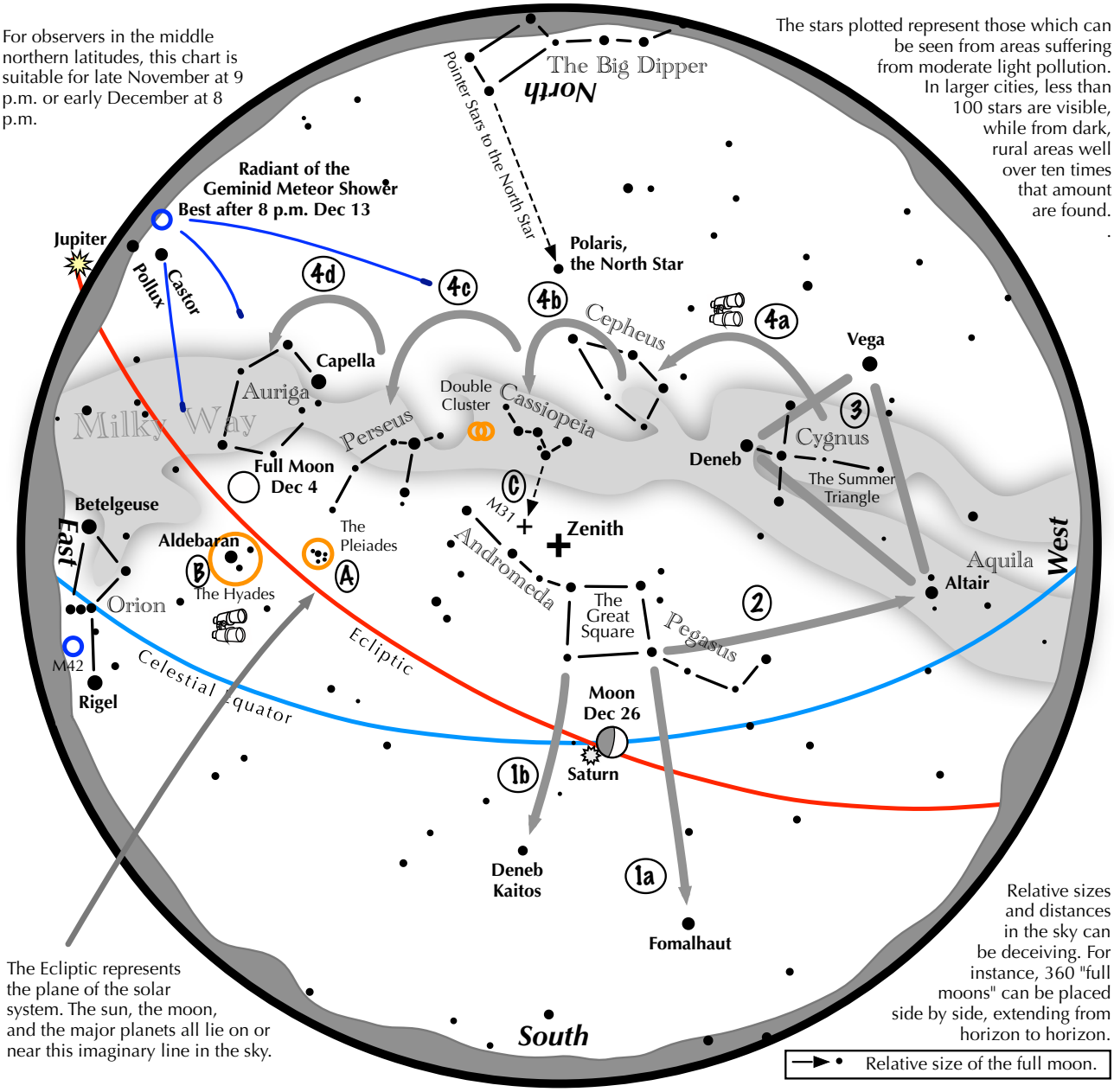
There's a lot we don't know about Comet 3I/ATLAS and about the universe. It wouldn't be much fun to be an astronomer if we knew everything already. But when there's something unknown, we humans like to fill that gap.

For astronomy mysteries, the gap tends to be filled with aliens. However, not knowing all the answers is not proof of aliens. It just means that we have work to do.

Navigating the December Night Sky

For observers in the middle northern latitudes, this chart is suitable for late November at 9 p.m. or early December at 8 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.

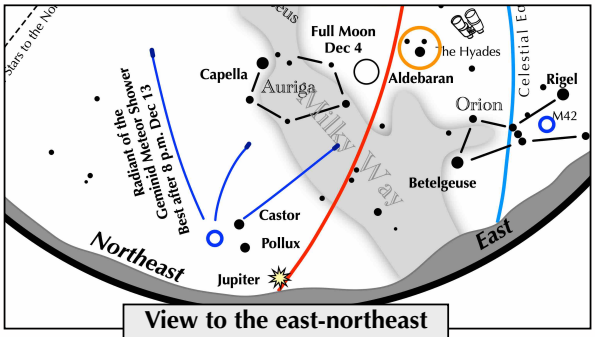
Navigating the December night sky: Simply start with what you know or with what you can easily find.

1. Face south. Almost overhead is the "Great Square" with four stars about the same brightness as those of the Big Dipper. Extend an imaginary line southward following the Square's two westernmost stars. The line strikes Fomalhaut, the brightest star in the southwest. A line extending southward from the two easternmost stars, passes Deneb Kaitos, the second bright star in the south.
2. Draw another line, this time westward following the southern edge of the Square. It strikes Altair, part of the "Summer Triangle."
3. Locate Vega and Deneb, the other two stars of the "Summer Triangle. Vega is its brightest member while Deneb sits in the middle of the Milky Way.
4. Jump along the Milky Way from Deneb to Cepheus, which resembles the outline of a house. Continue jumping to the "W" of Cassiopeia, to Perseus, and finally to Auriga with its bright star Capella.

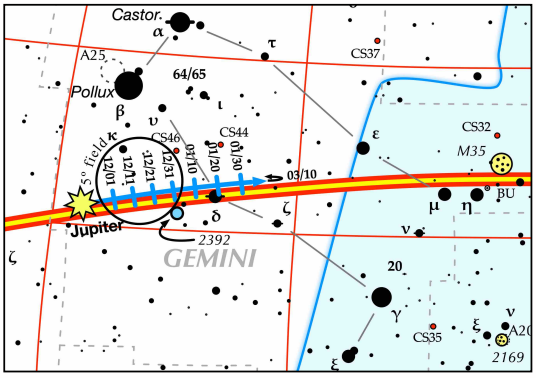
Binocular Highlights
A and B: Examine the stars of the Pleiades and Hyades, two naked eye star clusters.
C: The three westernmost stars of Cassiopeia's "W" point south to M31, the Andromeda Galaxy, a "fuzzy" oval.
D: Sweep along the Milky Way from Altair, past Deneb, through Cepheus, Cassiopeia and Perseus, then to Auriga for many intriguing star clusters and nebulous areas.

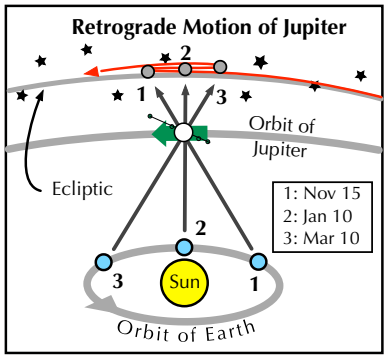
Astronomical League Outreach

On evenings in December (and January), try this challenge:



View to the east-northeast in early December at 10 pm





Jupiter moves in retrograde

On evenings in December, the Giant Planet slides westward in central Gemini to the lower right of Castor and Pollux.

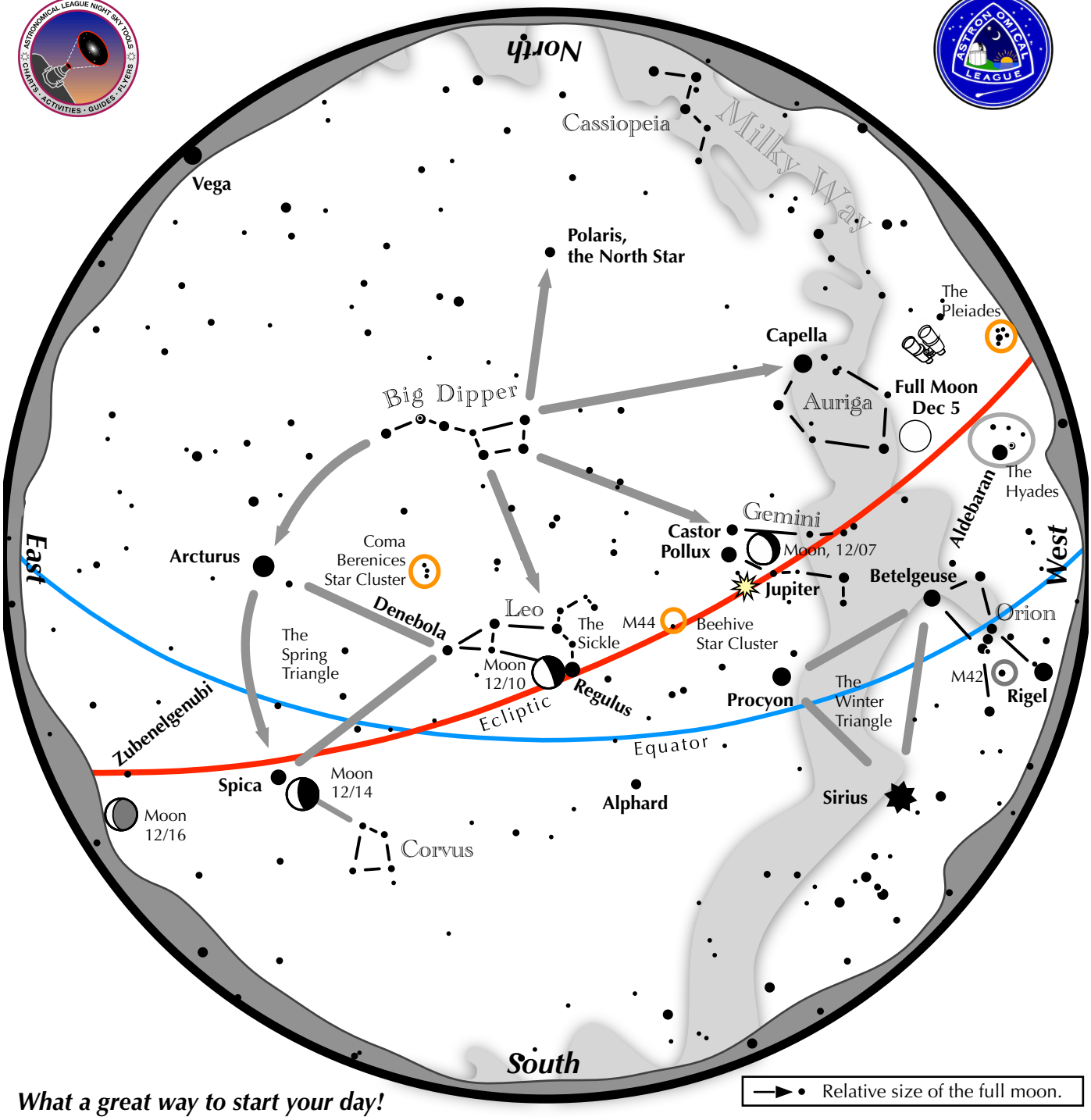
Observe, then plot its motion in the heavens. It continues its westward journey in January, but begins to slow in February. On about March 11, it halts and reverses direction.

The passing bright moon will hamper observations on December 4-8.

Why do this activity? This planetary dance can only be explained if both Earth and Jupiter orbit our sun following definable and slightly elliptical paths. Our view from Earth clearly shows this to those people who take the time to look carefully enough.

Navigating the December Morning Sky

2025



What a great way to start your day!

For observers in the middle northern latitudes, this chart is suitable for mid December at 5:00 a.m.

Late sunrises in December provide opportunities for early morning skywatching.

- Bright Jupiter shines high in the west.
- The near third quarter moon floats above Regulus on December 10.
- The waning crescent moon glows next to Spica on December 14.
- The thin crescent moon rises near the double star Zubenelgenubi on December 16.
- A great time for viewing the Big Dipper, Leo, and the Spring Triangle. And, in the second half of the month, it is time for galaxy viewing!

Astrophotography

Cave Nebula (C9), (Sh 2-155) by Jim White
Location - Cepheus
39 - 5 minute exposures
30 Darks, 25 Flats, 25 Dark Flats
Telescope - Celestron 925 EdgeHD
Mount - Celestron CGX
Celestron - OAG
Guide camera - ZWO ASI174MM Mini
Imaging camera - ZWO ASI2400MC Pro

Astrophotography

NGC 7331 – Spiral Galaxy in Pegasus, by Jason O'Flaherty

Edited in Siril, GraXpert, Photoshop, and Topaz Photo. 90 frames at 120 sec (10,800 sec total) f/10 1500 mm – Celestron NexStar 6SE & ZWO ASI2600MC Air (2024/09/05 – 06)

Astrophotography

Orion Nebula and Horsehead/Flame by Brett Boller
Williams Optics Redcat 51
ZWO ASI2600MC Duo 161 × 3 min subs
Captured in Friend, NE and Dorchester, NE
10/18, 10/21, 10/22
Processed in Pixinsight & Photoshop

From the Archives, November, 1985

PAC Observatory Steering Committee Meeting Report
Bryan Schaaf Chairperson

The PAC Observatory Steering Committee met for its second meeting on November 5th Since the last meeting, there was a total of nine observatory project questionnaires received (Thank You!). All but two responses were in the favor of the club observatory proposal "as generally described" on the questionnaire form. The two responses that objected to the project proposal "as it is generally described" did so on the grounds of undefined (unspecified) goals for the project and the means by which the project would be financed, such as "by a raise of club dues" and "special assessments."

There was also concern that such a project would be financially straining to the club membership and hinder club membership growth, particularly in the direction of potential young members. These are important points worth great consideration, but not necessarily obstacles to the reality of a club observing facility. Options of observatory or observing facilities that were discussed at the last meeting:

1) A PAC Membership owned observatory built on a permanent foundation. The satellite pads could be a separate project to be completed at some later date, after the initial building project.
2) An observatory building simply constructed that could be mobile or easily disassembled, for possible relocation in the future (either because of site difficulties or light pollution).
3) A simple observing site with only concrete slab supported telescope mounts for club members use. The option would involve only individually owned telescopes, much like our monthly star parties, but with a special site.

4) The OAS has offered to let the PAC in on their established observing site with the offered option to build an observatory there or construct a simple slab. The size of the PAC facility would be governed by the OAS's established guidelines… in effect they would be the landlords. This offer has been long standing, and although the landlord aspect isn't appealing, it is none the less a viable option worth consideration in the absence of others.

As an aide to gathering opinions and preferences of the PAC membership, please think of your opinions and preferences of the PAC membership, the committee members will

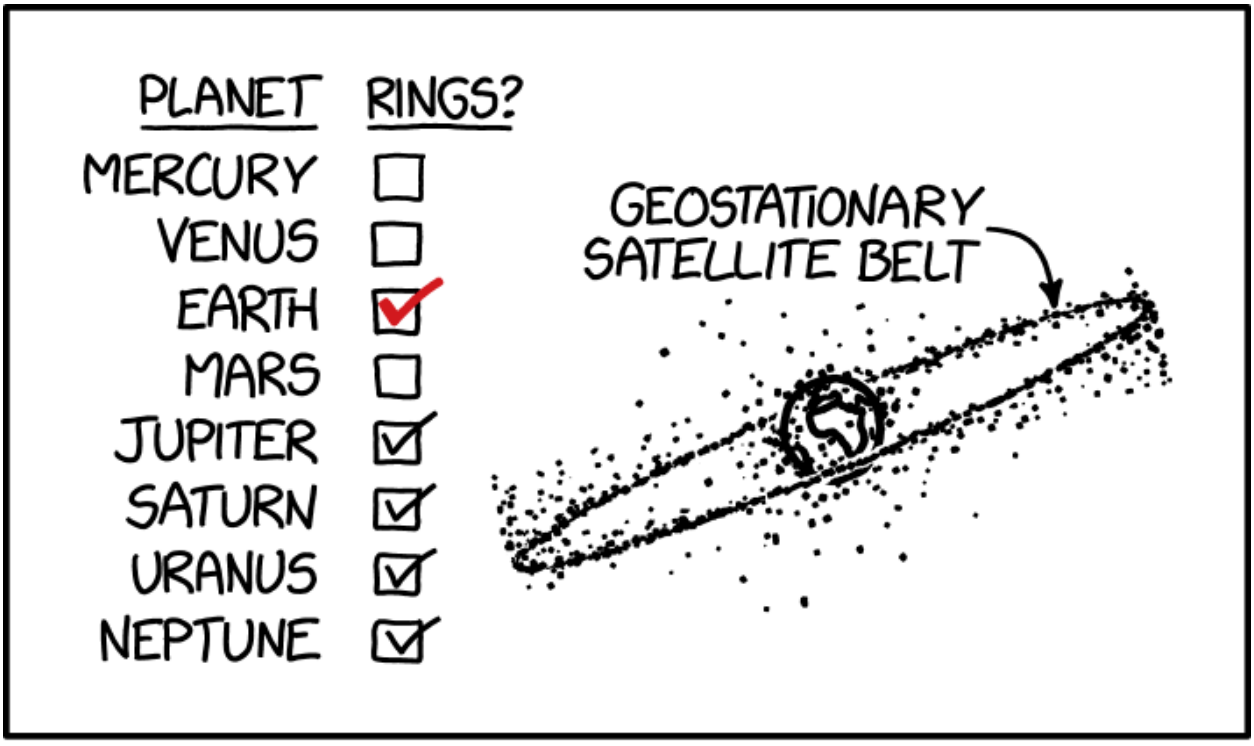
Archives, continued

likely be calling each of you and will ask specific questions.

In the meantime, please think of your opinions and ideas so that we may gather info more efficiently and determine in what direction to go.

Our next meeting is scheduled to be on December 3rd. As a rule, our committee meetings are held one week after the general meetings at the same place, and the same time (7:30pm, Hyde Observatory). All members are welcome to attend and express their views on the matter.

Here is a list of the committee members: Bryan Schaaf, John Lortz, Dave Knisely, Russ Genzmer, Steve Bornemeier, Steve Kell, Andy Corkill, Ron Veys, Bev Hetzel, Rick Johnson, Doc Manthey, John Glover, Lee Thomas.



ASTRONOMY FACT: A CENTURY AGO, EARTH DIDN'T HAVE RINGS, BUT WE HAVE ONE NOW! IT'S WHERE ALL THE SATELLITE DISHES ARE POINTED.

xkcd.com

MEMBERSHIP INFO

REGULAR MEMBER - $30.00 per year. Includes club newsletter, and 1 vote at club meetings, plus all other standard club privileges.

FAMILY MEMBER - $35.00 per year. Same as regular member except gets 2 votes at club meetings.

STUDENT MEMBER - $10.00 per year with volunteer requirement.

If you renew your membership prior to your annual renewal date, you will receive a 10% discount.

Club members are also eligible for special subscription discounts on Sky & Telescope Magazine.

CLUB TELESCOPES

To check out one of the club telescopes, please contact a club officer. Scopes can be checked out at a regular club meeting and kept for one month. Checkout can be extended for another month if there are no other requests for the telescope, but you must notify a club officer in advance.
100mm Orion refractor: Available
10 inch Meade Starfinder Dobsonian: Available.
13 inch Truss Dobsonian: Needs repair.
10 inch Zhumell: Needs mount.

Buy the book! The Prairie Astronomy Club: Fifty Years of Amateur Astronomy. Order online from Amazon or lulu.com.

ADDRESS

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