



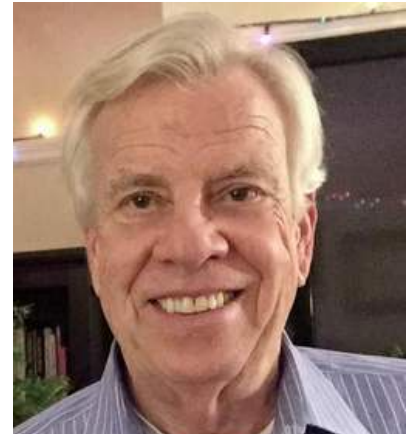
PAStimes

A Publication of the Phoenix Astronomical Society

Stu's Views • Stu Brackney, President PAS

Hi everyone. We are all enjoying this wonderful changing weather here in the Phoenix metro area, especially the cooler nights. Of course, these winter nights also bring us some wonderful views, like the Orion constellation and its star/planet nursery the Orion Nebula. I strongly suggest you use your www.stellarium.com app to identify upcoming objects in our night sky so you can plan your targets and viewing times.

Happy days are here for two college students at our Paradise Valley Community College. As I mentioned to you, your organization (PAS) this year donated two one-thousand-dollar scholarships to the college for students in astronomy. We have been informed they have been chosen. More information to follow as we plan to invite them to one of our upcoming events. Your annual membership and the sale of donated telescopes help make our Sam Insana PAS Student Scholarships possible.



Resources: if you have questions about astronomy here are two online websites you may want to check out:

Cloudy Nights: <https://www.cloudynights.com/classifieds/>

A wonderful place with forums to get advice on gear and get questions answered.

Astromart: <https://www.Astromart.com> Like Cloudy Nights, but you must pay a small annual fee.

Our awesome Membership Manager Joseph Sandy has moved out of state so we will miss him and his marvelous computer skills managing our online membership roster. So, computer whiz kids, call me [480-221-5711](tel:480-221-5711) if you want to volunteer with this activity.

Finally: Keep an eye out on our public website: [PAS Event Calendar and Registration Site](#) for all our upcoming events. Tell a friend and clear skies everyone.

Clear skies everyone, the stars belong to you...Stu

Calling all stargazers and space enthusiasts! We're compiling a list of must-read books on astronomy and would love your input. Whether it's a guide to the night sky, an in-depth exploration of the cosmos, or a novel that captures the wonder of space, let us know your favorites. Share your top picks for essential astronomy books and inspire others on their journey through the stars!

SUBMIT



In This Issue

[Upcoming Events](#)
[November Lecture](#)
[October Review](#)
[Night Sky](#)
[Kitt Peak trip](#)
[Star Tours](#)
[Comet](#)

[Astronomy Images](#)
[What's in the Sky This Month](#)
[Cosmic Classroom](#)
[Helpful Astronomy Websites](#)
[Announcements](#)
[For Sale](#)

November Upcoming Events



November 2024

2nd - Public Star Party- Apache Wash Trailhead Park
7th-Monthly Lecture Series - New development in the field of adaptive optics (AO)
21st- Telescope Workshop-PVCC Main Campus
30th- Public Star Party- Bronco Trailhead

December 2024

5th-Monthly Lecture Series - Dr. David Williams, Arizona State University
19th- Telescope Workshop-PVCC Main Campus
28th - Public Star Party- Apache Wash Trailhead Park

For more information and to register for these events, go to the [PAS Event Calendar and Registration Site](#)
It is important to register for all events. In case of an event change or cancellation, you will be notified via email.



November Lecture Series -Topic: New development in the field of adaptive optics (AO)

Dr. Al Conrad

Steward Observatory

Large Binocular Telescope Observatory

Intro to the topic: A new development in the field of adaptive optics (AO) on ground-based telescopes enables routine monitoring of changes on Jupiter's volcanic moon Io at scales down to ~80km (achieved), or even down to ~50km (in the limit). Our observations of Io, taken with SHARK-VIS on the Large Binocular Telescope (LBT) in Arizona, demonstrate this new capability. SHARK-VIS, which saw first light at LBT on October 2nd, 2023, is one of only a few visible-light AO instruments on large telescopes.

Location: Online session via Zoom:

Link to meeting:

<https://us02web.zoom.us/j/81193628193?pwd=NIBZN2IU204VnVySk5SZXhtZWc2UT09>

Biography: Al Conrad, associate staff scientist at the Large Binocular Telescope (LBT) received his PhD in Computer Science from the University of California at Santa Cruz in 1994. Before joining LBT in 2014, he worked as a software engineer and support astronomer at both Lick and Keck Observatories, then at Max Planck Institute for Astronomy, where he led the development of the adaptive optics system for LINC-NIRVANA (near-infrared imaging instrument). At LBT, Al has served as the point of contact for commissioning of several instruments. His current duties include the science archive, SHARKNIR (infra-red instrument), SHARK-VIS, and others. His research interests include asteroid systems and developing novel techniques to study comets, planets, and the moons of planets, in particular Jupiter's moon Io.

October- Annual PAS Social Event by Ruza Sabelja

Phoenix Astronomical Society held the annual social event on Thursday, October 3rd at the PVCC. The attendance at the event was about 40 members who were able to get to know each other, the board and managers. The PAS members had a chance to win a Dobsonian 10" telescope through a raffle game.

Stuart Brackney, president of the society, welcomed members during the opening speech and shared information on how to join the society, and where and how to purchase PAS patches and name badges for future events.

Display of meteorites, collected by members, was set up during the event. This offered an opportunity to all PAS members to learn about their origin and compositional properties. The society also shared a slideshow to present astrophotography pictures taken by members, who spent countless hours and nights in collecting and processing data to allow the public to have a look at the deep skies' objects like nebulae, star clusters, galaxies, and constellations.

As the event neared its end a winner of the telescope had to be drafted. The society was proud and excited to announce the winner of the wonderful Dobsonian 10" telescope, Clayton! He is 10 years old and was the youngest attendee of the night!

Clayton goes to school at Grayhawk Elementary school and is attending the 5th grade. He enjoys playing soccer, basketball and going to the swimming pool! (soon to be adding stargazing to the list).



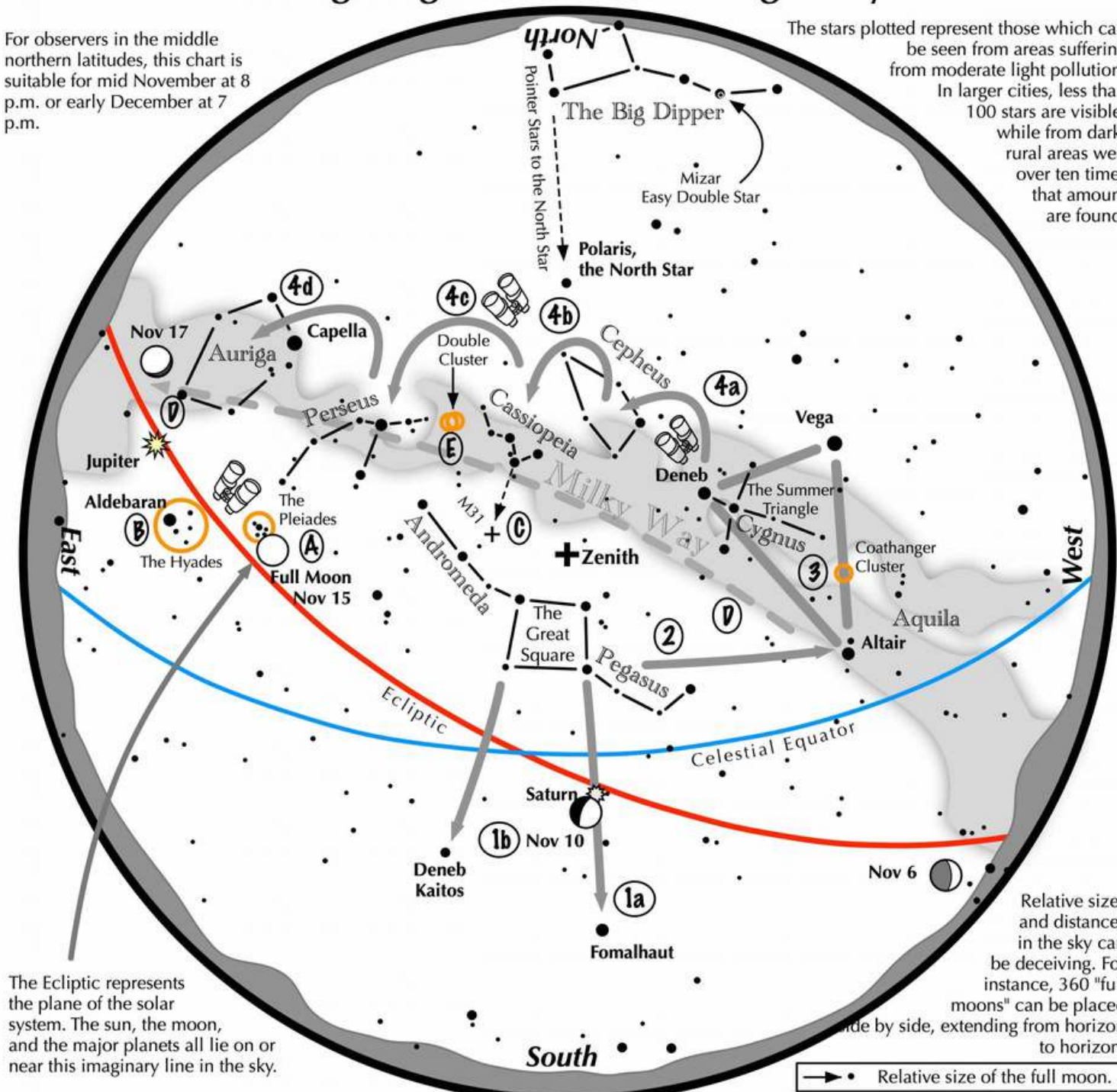
Clayton is very excited to start looking at the night sky with his new telescope! Congratulations and may the night sky stay dark and clear for you!



Navigating the November Night Sky

For observers in the middle northern latitudes, this chart is suitable for mid November at 8 p.m. or early December 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 November night sky: Simply start with what you know or with what you can easily find.

- 1 Face south. Almost overhead lies the "Great Square" with four stars about the same brightness as those of the Big Dipper. Extend a line southward following the Square's two westernmost stars. The line strikes Fomalhaut, the brightest star in the south. A line extending southward from the two easternmost stars, passes Deneb Kaitos, the second brightest star in the south.
- 2 Draw a line westward following the southern edge of the Square until 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, then 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. **E:** The Double Cluster.



Astronomical League www.astroleague.org/outreach; duplication is allowed and encouraged for all free distribution.

****My visit to Kitt Peak by Mark Johnston****

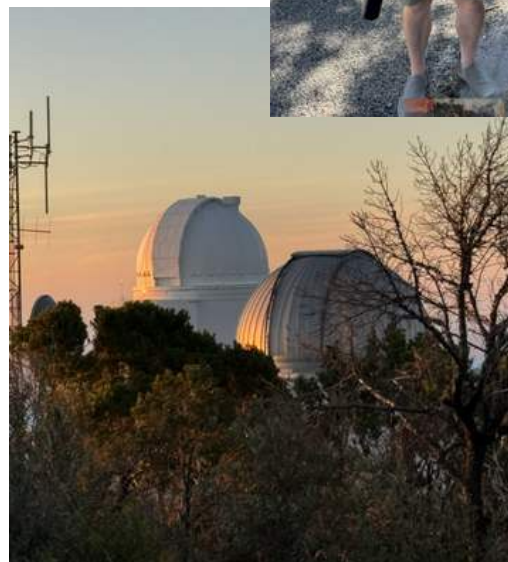
Kitt Peak has reopened and is a great place to visit. Kitt Peak is home to the largest number of optical and radio telescopes in the world. It has almost two dozen world-class instruments.

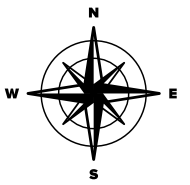
Skies are dry, clear and dark. Sunset from the mountain was stunning, and I saw the Green Flash for the first time. Apparently they see it quite often at sunset there. Outreach programs are available for both evening and overnight participants. I did that and it was a lot of fun. They provide binoculars and you can also look at objects through a 20" observatory telescope. Skies were very dark and the Andromeda galaxy and M13 globular cluster were naked-eye visible. Through the scope we saw M31, M11, M57, M13, Epsilon Lyra, Saturn, and the Moon.

I also toured the control room of the 4 meter Dark Energy Survey telescope. It does a spectroscopic analysis of 5000 galaxies simultaneously and switches to another 5000 galaxies every 1000 seconds. At the 3.5 meter WIYN telescope I met the team doing detailed analyses of exoplanets discovered by the TESS telescope.

An X-class flare a couple of days previously caused an aurora that was visible from the peak. Amazing to see at 32° north latitude.

There's a fun visitor center with interactive displays and they are building a huge expansion you can get a preview of which will open in 2025. It's about 2.5 hours from Phoenix. If you're at all interested in astronomy I highly recommend you plan a visit!





After a five-year hiatus, PAS had the amazing pleasure of working the three-day music event FORM festival where all walks of life enjoyed live music, delicious food, many beverages, and views of the heavens. The remote futuristic eco-city drew roughly 2,500 attendees to the long-awaited return of FORM which sold out in under 24 hours.

Arcosanti was built to experiment with progressive urban planning concepts and to demonstrate how to improve urban conditions while minimizing the environmental impact. The project's core values include frugality, resourcefulness, ecological accountability, experiential learning, and leaving a limited footprint. Arcosanti is home to a part-time community of about 50 people, as well as intermittent work-shoppers. Visitors can take guided tours, hike trails, and visit the café.

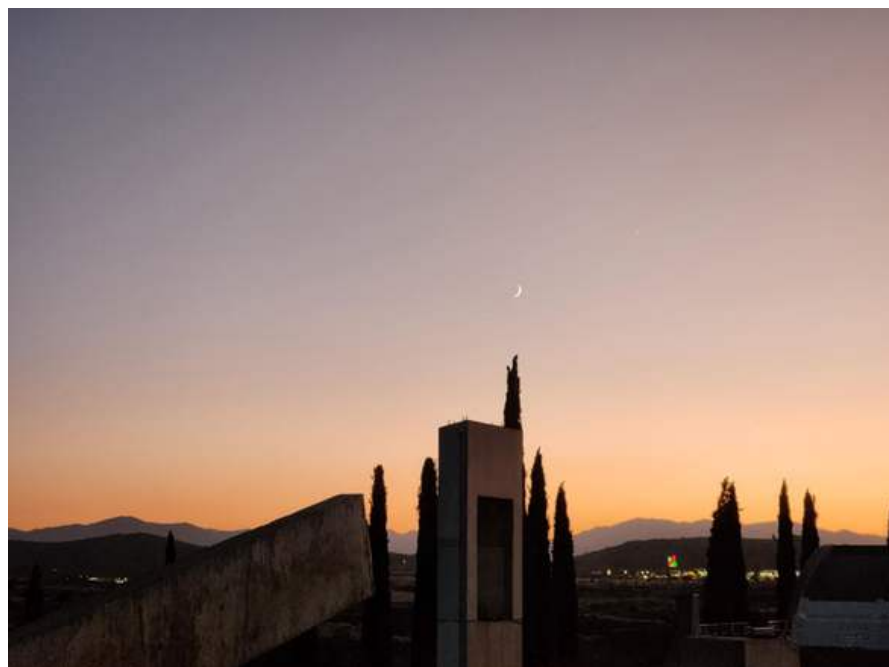


It was an absolute pleasure working the event and hearing from multiple attendees who said, "I will never forget the first time I saw Saturn, here at Arcosanti." Thanks Star Tours members for all your hard work! If you are interested in joining amazing adventures of astronomy that the Star Tours members get to take part in, please reach out to Andrew Stone at andrews@pasaz.org

Here is an excerpt from an article written by [billboard.com](https://www.billboard.com):

A Starry-Eyed Symphony

The Sonoran Desert transformed into a celestial canvas at night. With minimal light pollution in the remote area, the Phoenix Astronomical Society hosted evening stargazing sessions on the rooftop overlooking the main amphitheater. On Saturday night, attendees were able to peek into a cosmic light show through high-resolution telescopes as Angel Olsen played in the background, for an experience that was pure magic. The experience was a poignant reminder of our place in the grand scheme of the universe, a feeling that resonated throughout the weekend, even when the music ended.



Crescent Moon with beautiful Venus in the setting sun over the concert venue taken by Andrew Stone

Celestial Spectacle: Comets and the Arrival of C/2023 A3 (Tsuchinshan-ATLAS)

by Richard Meyers

Comets, often described as "dirty snowballs" or "snowy dirtballs," have fascinated humanity for millennia. These icy wanderers of the solar system are remnants from its formation over 4.5 billion years ago, composed primarily of ice, dust, and rocky material. As we approach the latter half of 2024, astronomers and sky-watchers alike are buzzing with excitement over the arrival of a particularly bright visitor: Comet C/2023 A3 (Tsuchinshan-ATLAS).

At the heart of every comet lies its nucleus, a solid core typically ranging from a few hundred meters to tens of kilometers in diameter. As comets approach the Sun, the increasing heat causes their icy materials to sublimate, creating the distinctive coma (a fuzzy, glowing envelope surrounding the nucleus) and tail that can stretch millions of miles long.



Comets originate from two primary regions in our solar system: the Kuiper Belt, beyond Neptune's orbit, and the more distant Oort Cloud. They follow highly elliptical orbits around the Sun, with some taking hundreds of thousands of years to complete a single revolution. Comet C/2023 A3, a long-period comet from the Oort Cloud, boasts an orbital period of approximately 80,660 years.

Discovered independently by two observatories in early 2023 - Purple Mountain Observatory in China and ATLAS in South Africa - C/2023 A3 (Tsuchinshan-ATLAS) has quickly become one of the most anticipated astronomical events of 2024. Its official designation follows the standard naming convention for comets, honoring both discovering observatories.

What makes C/2023 A3 particularly exciting is its predicted brightness. Astronomers estimated it could reach a magnitude of -4.9 back on October 9, 2024, potentially making it visible to the naked eye. This level of brightness is rare for comets, occurring roughly once per decade. The comet's tail, observed to be approximately 21° long (about 42 times the size of the Full Moon's disk), promises to be a spectacular sight.

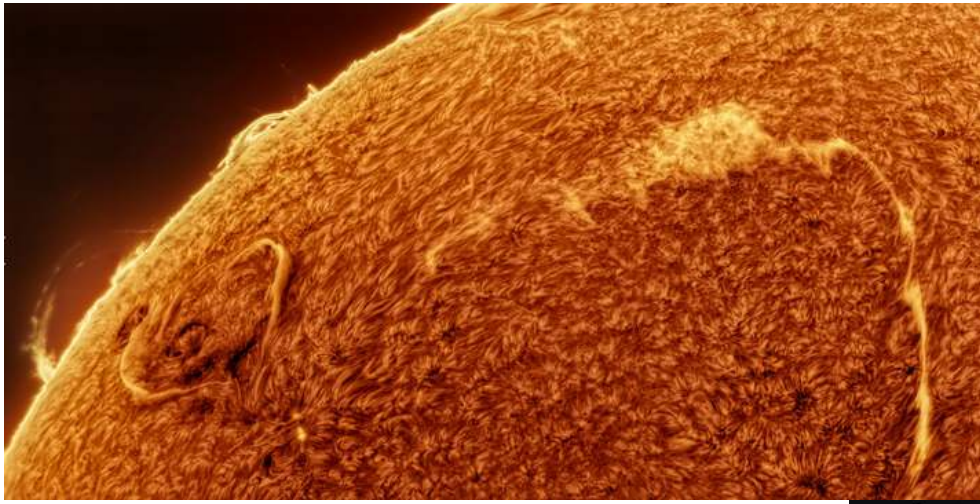
The comet's journey through our inner solar system offered a unique observing opportunity. It made its closest approach to the Sun (perihelion) on September 27, 2024, at a distance of 58.6 million kilometers. Shortly after, on October 12, it made its closest approach to Earth, passing at a distance of 70.672 million kilometers.

For observers, the best viewing opportunities were expected in early October for the Southern Hemisphere and mid-October for the Northern Hemisphere. The period around October 14–15 was particularly promising, with the comet positioned higher in the western sky after sunset.

Beyond its visual appeal, C/2023 A3 holds significant scientific value. As a well-preserved remnant from the solar system's formation, it offers researchers insights into the conditions and materials present during our cosmic neighborhood's early stages. Its close approach provides a rare opportunity to study the composition and behavior of these ancient celestial bodies in detail.

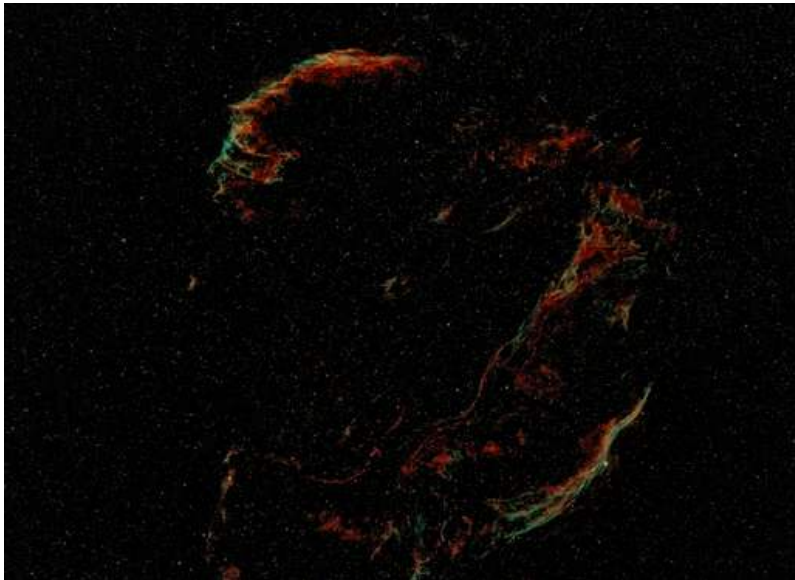
The arrival of Comet C/2023 A3 (Tsuchinshan-ATLAS) serves as a reminder of the dynamic nature of our solar system. As we prepare to witness this celestial spectacle, we're connected to a long history of human fascination with comets. From ancient civilizations who saw them as omens to modern scientists launching space missions to study them up close, comets continue to captivate our imagination and drive our exploration of the cosmos.





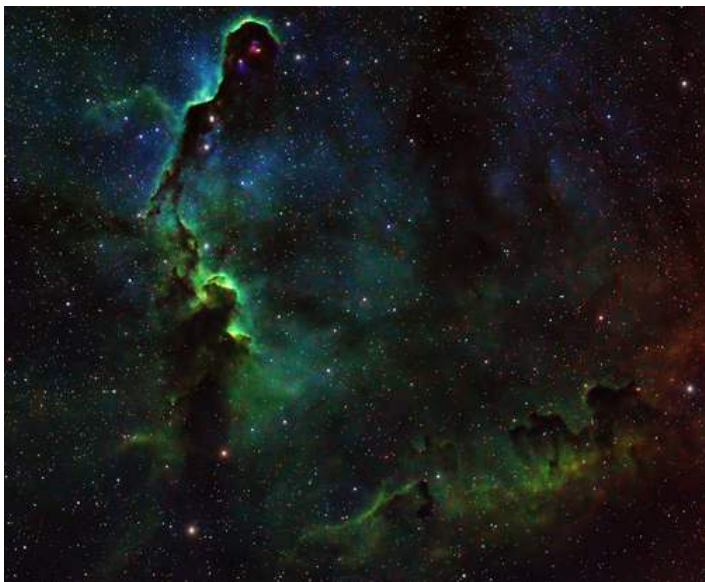
**SUN-MARK
JOHNSTON**

**MOON-MARK
JOHNSTON**



**VEIL COMPLEX -
MARK JOHNSTON**

IC1396 & NGC7635 -RICHARD SAUERBRUN



7 Telescope Targets

Each month, we feature 7 good targets for small telescopes that should be visible in the evening. For the month of November, the targets are:

1. NGC7662 Blue snowball nebula- Surprisingly bright compact blue ball, like a large Neptune
2. M31/32/110 Andromeda Galaxy-The largest galaxy near us. Look for its two faint companion galaxies M32 and M110
3. NGC7009 Saturn nebula-Another small but bright planetary nebula with 'handles' on each side – looks like Saturn!
4. Almach -Beautiful blue/yellow double star in Andromeda
5. NGC253 Sculptor galaxy – Easiest galaxy to spot in a telescope after Andromeda
6. NGC7318B Stephan's Quintet-This is a challenge but this compact galaxy group in Pegasus is 200-340 million light years away so it's fun to look for under a dark sky
7. M15 -Bright globular cluster in Pegasus

Cosmic Classroom (CC)

November - Stargazing Tips and Tricks: Offer practical advice and tips for stargazing enthusiasts, including how to find constellations, identify stars, and navigate the night sky.



How do you find the celestial wonders that you want to see?

Finding celestial targets the modern way

Computerized "GoTo" style telescopes ... the quick and easy method:

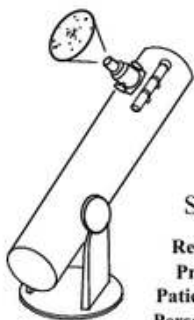
- ✦ The telescope's computer operation must first be mastered.
- ✦ Except for the newest generation of telescopes, you still need to have some knowledge of the brightest stars.
- ✦ These instruments tend to be costly.
- ✦ Once the battery power is depleted, the telescope must be used manually.
- ✦ Data base typically contains over 1000 celestial objects. But that doesn't mean that all objects will give meaningful views.



As when using Binoculars, try Triangulation

Brighter objects are directly visible in binoculars and the finderscope

On a star chart, locate the position of the object with respect to nearby recognizable objects, such as bright stars. Judge the relative distances and angles from the guide objects to the target and mentally project them onto the sky. Then, carefully aim the telescope to that spot.

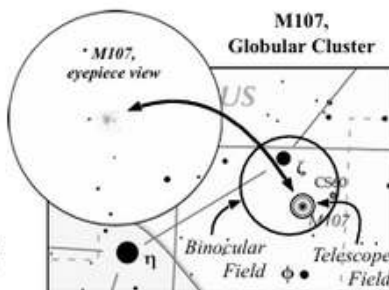


Star Hopping is an Art

Requires:
Practice,
Patience, and
Perseverance!

**It is well worth the
time and effort.**
Your reward?
A personal view
of the Universe.

- ✦ Must have a **detailed** star map.
- ✦ Begin at a reference star that you can find.
- ✦ Match the stars on the map with those in the eyepiece.
- ✦ Hop among the stars in each subsequent field of view until the correct field is reached.

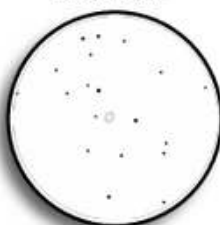


What will a telescope reveal? The wonders you see will be with your own eyes. You will see the universe as it truly is, not computer-enhanced, electronically obtained images.

Andromeda Galaxy



Ring Nebula



Orion Nebula



Helpful Astronomy Websites

by Mark Johnston

The following websites are great free resources to help you plan and enjoy your astronomy adventures

Astromart: astromart.com/

This is one of the top two sites for buying and selling used astronomy gear, product reviews, and forums where you can discuss any aspect of astronomy with other enthusiasts. A small fee is required.

Astrometry.net: <https://nova.astrometry.net/>

This site will take any astronomy image you send it (galaxy, starfield, nebula, etc) and then tell you what it is and where it is in the sky.

Astronomy Tools: astronomy.tools/calculators/field_of_view/

This site has a lot of capabilities but I use it primarily to figure out how a target (e.g. the Helix nebula) will look in my eyepiece or astronomy camera. You pick your scope, camera, eyepiece and target and the site does the rest.

Astrospheric: www.astrospheric.com/

Probably the best short term astronomy weather forecasting tool, providing predictions of clouds, transparency and seeing.

Clear Sky Charts: www.cleardarksky.com/

Excellent source of astronomy seeing conditions forecast. Also a great tool for finding observing sites with lower light pollution.

Cloudynights: www.cloudynights.com/

This is one of the top two sites for buying and selling used astronomy gear, product reviews, and forums where you can discuss any aspect of astronomy with other enthusiasts. Free.

Dark site finder: darksitefinder.com/map/

Great website for finding a dark observing location.

Heavens above: heavens-above.com/

Top site for predicting naked eye observations of satellites. See when the ISS is visible in your neighborhood!

Jupiter transits: shallowsky.com/jupiter/

For anyone with a small telescope, this is a great site. You can find out when the Great Red Spot and Jupiter's satellite transits are visible.

Solar Dynamic Observatory (SDO): <https://sdo.gsfc.nasa.gov/data/>

Find out how the Sun looks right now, at various wavelengths. If you own a solar telescope, this site coupled with Astrospheric is all you need to plan fabulous solar observing!

Telescopius: telescopius.com/

This site is very helpful in planning an observing evening. It will tell you when any particular target is rising and setting and when is the best time to observe it. This allows you to sequence your observing in a planned manner.

ATTENTION PLEASE



Mark Johnston has been selected by the National Science Foundation to be an ACEAP Ambassador to Chile.

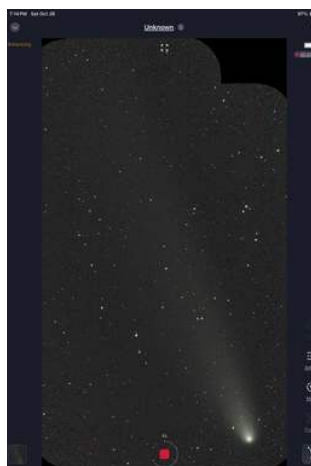
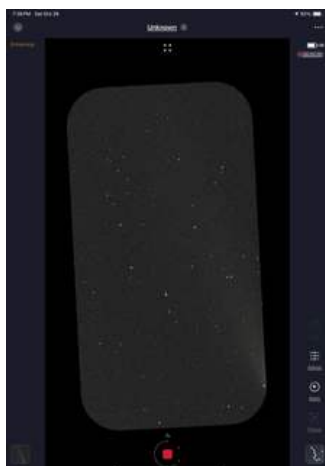
<https://www.astroambassadors.com/2024-ambassadors/>

The Astronomy in Chile Educator Ambassadors Program (ACEAP) is a collaboration between Associated Universities Inc. (AUI) and Association of Universities for Research in Astronomy (AURA), and the observatories they manage in Chile, including CTIO and Gemini which are now part of the new NSF's National Optical-Infrared Astronomy Research Laboratory (NSF's NOIRLab), and the National Radio Astronomy Observatory and ALMA, and is supported by the National Science Foundation (NSF 1439408, NSF 1723697, and NSF 2034209). The Program brings amateur astronomers, planetarium personnel, and K-16 formal and informal astronomy educators to US astronomy facilities in Chile. While at these facilities, ACEAP Ambassadors will receive extensive training about the instruments, the science, data products, and communicating science, technology, engineering, and mathematics (STEM) concepts. When they return home, the Ambassadors share their experiences and observatory resources with schools and community groups across the US.



ZWO Seestar Fans - New Release Highlights (October 26th)

The ZWO Seestar introduces a powerful Mosaic Mode, enabling users to capture multiple overlapping images of celestial objects and seamlessly stitch them together. This feature is perfect for creating panoramic views, allowing both novice and experienced astronomers to easily produce stunning wide-field images. With Mosaic Mode, the complex process of capturing and merging images is simplified, opening up new possibilities in astrophotography for all skill levels





Telescope Items For Sale

This is a first come, first served offer.

Review the list. Decide what you want.

Email stuartbrackney@pasaz.org what you want.

He will set up a day/time for you to come to his location to purchase.

Bring your check payable to Phoenix Astronomical Society or cash ... no credit cards please.



Celestron 6" F/4 Newtonian Astrograph Telescope

- Fast 6"-aperture reflector lets you take short exposures with bright, high-resolution results
- Precise 2" dual-speed (10:1) linear-bearing Crayford focuser lies 7" back in the optical tube to block stray light and boost contrast
- Orion-exclusive steel reinforcement plate under focuser eliminates flexure with heavy imaging gear attached
- Compact 22.5" length and light 12.7 lb. assembled weight doesn't require an enormous mount
- Includes two heavy-duty hinged tube rings, 8x50 finder scope, dovetail mounting bar, and more

Member Price: \$250 / Non-Member Price: \$400



Orion 8" F/4 Newtonian Astrograph Telescope

- Affordable 8"-class Newtonian telescope optimized for wide-field astrophotography
- The 200mm (7.9") aperture f/4.0 achromatic primary mirror is made from high-quality BK7 glass with enhanced aluminum coatings to provide >92% reflectivity for bright, vivid images
- Compact and lightweight at just 28" long and 15 lbs. can be supported on a mid-sized equatorial mount
- Includes 8x50 finder scope, 1.25" Sirius Plossl eyepiece, 12V cooling accelerator fan, and a quick-collimation cap. A coma corrector (sold separately) is recommended for optimal flat-field performance.

Member Price: \$350 / Non-member Price: \$450

SOLD



Orion SkyQuest XT10 10" Dobsonian Telescope

- Big 10" (254mm) aperture reflector telescope gathers loads of light for great views of nebulae, galaxies, star clusters, and close-up study of the Moon
- Stable support provided by the wonderful Orion CorrectTension adjustment knob that lets you adjust the telescope's balance
- Simple Dobsonian design makes this telescope smartly equals a reflector telescope for the price
- Includes 7mm and 1.25" Sirius Plossl telescope eyepieces (25mm and 10mm), a 9x50 right-angle image finder scope, eyepiece rack, collimation cap, and Starry Night software

Member Price: \$300 / Non-Member Price: \$500

Donated

Various Filters – 1.25"

- Red
- Yellow
- Blue
- Green
- Multiple O3 filters

Member Price: \$100 / Non-Member Price: \$200