



Ephemeris

The Official Newsletter of the Prescott Astronomy Club (PAC)
e-phem-er-is: a time-based listing of future positions of solar system objects.

January 2024



Original Photo: Lucas Pezeta

Prescott Astronomy Club Meeting

Wednesday, January 3rd, 2024, at 6:00pm
Prescott Public Library, Founder's Room

Speaker: Dr. Pragati Pradhan, *Animals & Astronomy*

Topic: Since ancient times, the practice of Astronomy by humans is well known. In this talk, Dr. Pradhan will present astronomy in/for/from other animals, besides humans. She will discuss case studies of how some animals like dung-beetles use 'astronomy' in their everyday life. She will also touch upon the inspiration that astronomers obtain from the structural designs of some animals (e.g., lobsters) to build spacecrafts with greater observing efficiency. She will introduce the idea of how we humans can use astronomy for the benefit of other animals and foster an environment of mutual co-existence for the betterment of the planet.

Bio: Dr. Pragati Pradhan is an Asst. Professor in the Department of Physics and Astronomy at the Embry-Riddle Aeronautical University in Prescott. Prior to ERAU, Dr. Pradhan worked as a post-doctoral researcher at MIT and Penn State University. She obtained her Ph.D. from one of the ivy-league institutes in India, the Raman Research Institute. Her research expertise mainly focuses on the high energy emission from cosmic objects like neutron stars, analyzing X-ray emission from these exotic objects. In other words, she X-rays the Universe to unveil its extreme physics, in all its glory.

Prescott Astronomy Club Meeting

Wednesday, February 7th, 2024, at 6:00pm
Prescott Public Library, Founder's Room

Speaker: TBD (watch the club website www.prescottastronomyclub.org for speaker announcements)

Prescott Astronomy Club Holiday Party

December 6th, 2023

Note from the President

The holiday season had an uplifting event for members of the PAC that attended the Christmas Party at the Hasayampa Inn. 46 people celebrated our year of star parties, eclipse event, speaker program. We look forward to 2024 with anticipation of the new initiatives for the New Year, 50th anniversary of PAC and promotion of dark skies while continuing our current programs.

The awards committee (Brian and Art) recognized 4 people who have greatly contributed to the success of the club over the last 2-3 years: Susanne Vaughan for overseeing the last 3 holiday parties, Doug Tilley for overseeing the club picnics, James Vaughan for bringing another frontier of astronomy to our club, radio astronomy, and Ken Olson who has been a stalwart volunteer for almost all the star parties since Aug of 2021.

Also, this was a good opportunity to talk with new members in a lighted room away from the usual dark sky environment we usually find ourselves. We all made new connections and found common interests outside of astronomy.

Have a Happy New Year!



Photo Credit: Susanne Vaughan

Need More kNights in Shining Armor

Wow! The Prescott Astronomy Club has come a long way in the last couple of years.

- Membership has grown from 43 memberships to over 80 (100 if you count family members).
- The speaker program has grown in popularity and our meeting attendance is larger than ever.
- New webmaster and new website
- New Editor updated the look of our newsletter.
- Our Starry nights and Outreach programs have increased, and public awareness has grown.
- METASIG has been restarted.

This is due to the hard work of the club's board and volunteers. I want to thank all of you for your enthusiasm and generosity.

Before the pandemic, membership and volunteer participation were declining which left the club ill-prepared to deal with the challenges of such a blow. In the meantime, our webmaster and newsletter editor retired after years of service. We have been able to fill the board again, replace our respected predecessors, grow our volunteer pool, and overcome the challenges we faced over the last two years.

Moving forward, we need more volunteers. Right now, we have 8 board members and 5 other volunteers that bear much of the load. There are another 5 or 6 people who regularly volunteer their time, telescopes, binoculars, and knowledge of the sky for Starry Nights and Outreach. To continue and grow our mission, the club needs more members to help. **Come and help with the Prescott Astronomy Club and spread the love of our hobby!**

LIST OF CURRENT NEEDS. Contact info is included or you can talk to the person or board member at the meeting.

Second Webmaster	Help with updates and support of website based on WordPress. Contact Brian Blau vp@prescottastronomyclub.org
Telescope Volunteers for Starry Nights and Outreach Star Parties	Expand our pool of telescope volunteers and guides, members who will answer questions and who people around the sky. Big events coming in October - Highland Center, Talking Rock, and Partial Solar Eclipse. Contact Brian Blau. vp@prescottastronomyclub.org
Picnic	Help with setup and clean up. Show up early or stay late.
Christmas Party	Assist with party favors, name cards, door prizes. Contact Susanne Vaughn susanne.vaughan@gmail.com
Refreshments	Help and backup snack table. Contact Jill Albers.

New Programs - programs waiting on volunteers to get started.

School Outreach	Contact and plan astronomical topics/activities with schoolteachers. Contact Art Arnold-Roksandich p@prescottastronomyclub.org
Outreach Coordinator	Private requests especially for young people camps, celestial events, such as eclipses, comets, etc. for public viewing. Contact Art p@prescottastronomyclub.org or Brian vp@prescottastronomyclub.org
Dark Site Committee	New committee for locating and listing dark sites near Prescott for members, possibly locating a permanent site for the club. Dark Sky Promotion - increase public awareness for preserving dark skies. Contact Brian vp@prescottastronomyclub.org
Publicity and Social Media	Notify local media of upcoming events. Establish a social media presence. Contact Art p@prescottastronomyclub.org
Club Merchandise	Design and select vendor to put our logo on mugs, water-bottles, t-shirts, caps, etc. Contact Art p@prescottastronomyclub.org
Videographer/Zoom	Video speakers and handle zoom as needed. Contact Art p@prescottastronomyclub.org

A banner for "NASA Night Sky Notes" featuring a dark background with a bright, glowing celestial object, possibly a comet or nebula, in the center. The text "NASA Night Sky Notes" is written in a large, white, sans-serif font across the middle of the banner.

NASA Night Sky Notes

Original Photo: unknown

Connecting the "Dots" with Asterisms

By Kat Troche

In our [December Night Sky Notes](#), we mentioned that the Orion constellation has a distinct hourglass shape that makes it easy to spot in the night sky. But what if we told you that this is not the complete constellation, but rather, an [asterism](#)?

An asterism is a pattern of stars in the night sky, forming shapes that make picking out constellations easy. Cultures throughout history have created these patterns as part of storytelling, honoring ancestors, and timekeeping. Orion's hourglass is just one of many examples of this, but did you know Orion's brightest knee is part of another asterism that spans six constellations, weaving together the Winter night sky? Many asterisms feature bright stars that are easily visible to the naked eye. Identify these key stars, and then connect the dots to reveal the shape.

Asterisms Through the Seasons

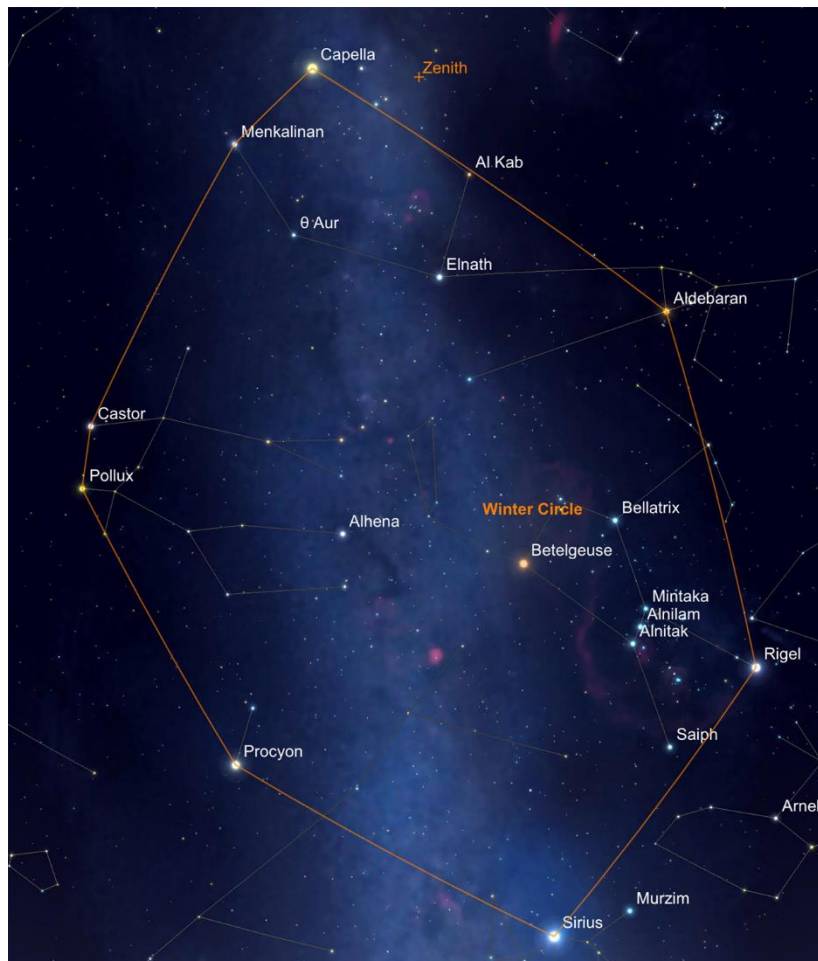


Photo Credit: Sky Safari

Stars that make up the Winter Circle, as seen on January 1, 2024.

Try looking for these asterisms this season and beyond:

- **Winter Circle** – this asterism, also known as the Winter Hexagon, makes up a large portion of the Winter sky using stars Rigel, Aldebaran, Capella, Pollux, Procyon, and Sirius as its points. Similarly, the **Winter Triangle** can be found using Procyon, Sirius, and Betelgeuse as points. **Orion's Belt** is also considered an asterism.

- **Diamond of Virgo** – this springtime asterism consists of the following stars: Arcturus, in the constellation Boötes; Cor Caroli, in Canes Venatici; Denebola in Leo, and Spica in Virgo. Sparkling at the center of this diamond is the bright cluster **Coma Berenices**, or Bernice's Hair – an ancient asterism turned constellation!
- **Summer Triangle** – as the nights warm up, the Summer Triangle dominates the heavens. Comprising the bright stars Vega in Lyra, Deneb in Cygnus, and Altair in Aquila, this prominent asterism is the inspiration behind the cultural festival [Tanabata](#). Also found is Cygnus the Swan, which makes up the **Northern Cross** asterism.
- **Great Square of Pegasus** – by Autumn, the Great Square of Pegasus can be seen. This square-shaped asterism takes up a large portion of the sky, and consists of the stars: Scheat, Alpheratz, Markab and Algenib.

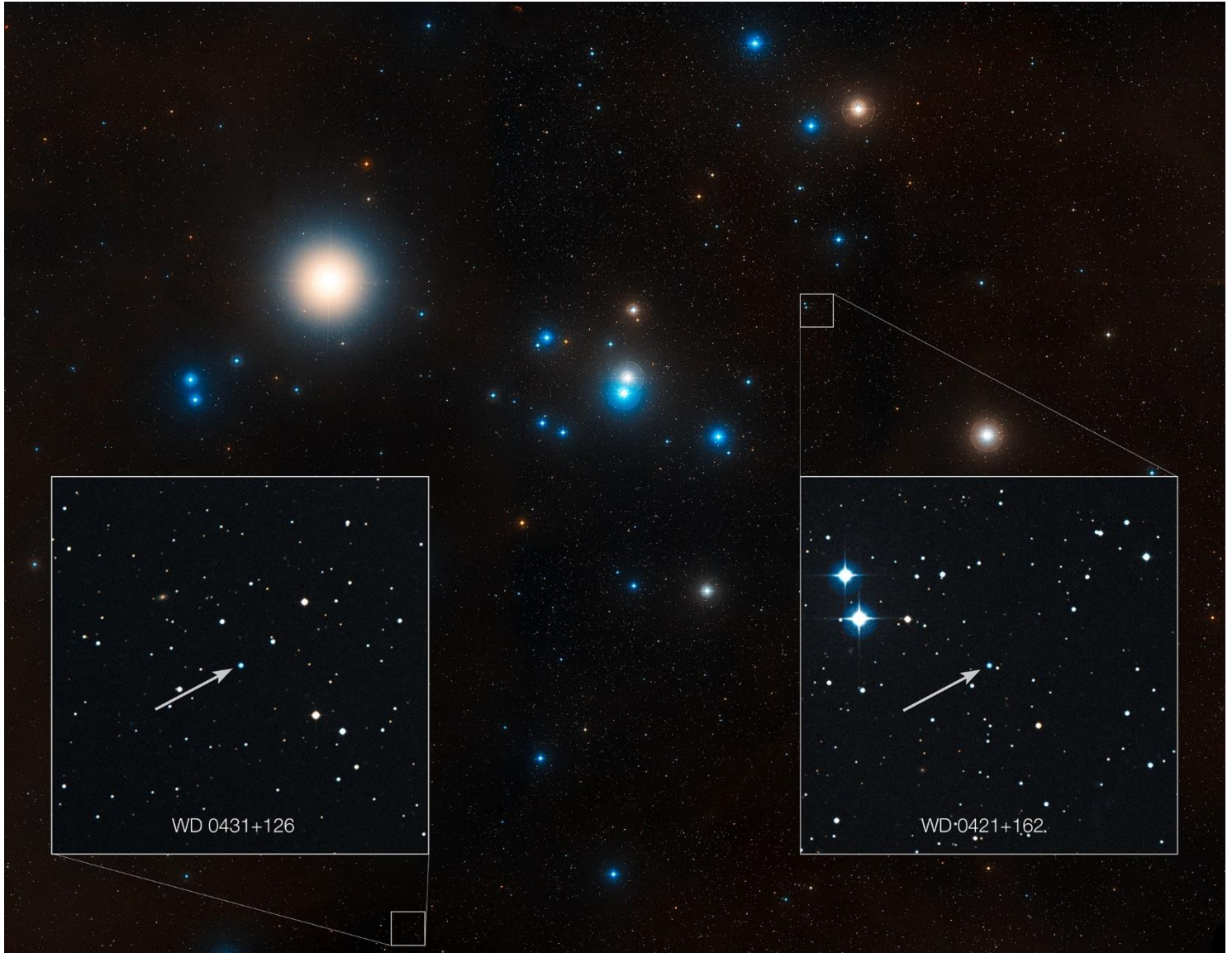


Photo Credit: NASA, ESA, STScI, and Z. Levay (STScI)

This image shows the region around the Hyades star cluster, the nearest open cluster to us. The Hyades cluster is very well-studied due to its location, but previous searches for planets have produced only one. A new study led by Jay Farihi of the University of Cambridge, UK, has now found the atmospheres of two burnt-out stars in this cluster – known as white dwarfs – to be “polluted” by rocky debris circling the star. Inset, the locations of these white dwarf stars are indicated – stars known as WD 0421+162, and WD 0431+126.

Tracing these outlines can guide you to objects like galaxies and star clusters. The Hyades, for example, is an open star cluster in the Taurus constellation with [evidence of rocky planetary debris](#). In 2013, Hubble Space Telescope’s [Cosmic Origins Spectrograph](#) was responsible for breaking down light into individual components. This observation detected low levels of carbon and silicon – a major chemical for planetary bodies. The Hyades can be found just outside the Winter Circle and is a favorite of both amateur and professional astronomers alike.

How to Spot Asterisms

- **Use Star Maps and Star Apps** – Using star maps or stargazing apps can help familiarize yourself with the constellations and asterisms of the night sky.
- **Get Familiar with Constellations** – Learning the major constellations and their broader shapes visible each season will make spotting asterisms easier.
- **Use Celestial Landmarks** – Orient yourself by using bright stars, or recognizable constellations. This will help you navigate the night sky and pinpoint specific asterisms. Vega in the Lyra constellation is a great example of this.

Learn more about how to stay warm while observing this Winter with our upcoming mid-month article on the [Night Sky Network page](#) through NASA's website!

Backyard Astronomer



Original Photo: Eberhard Grossgasteiger

The Backyard Astronomer - December 2023

Dancing Planets

By Adam England, The Backyard Astronomer

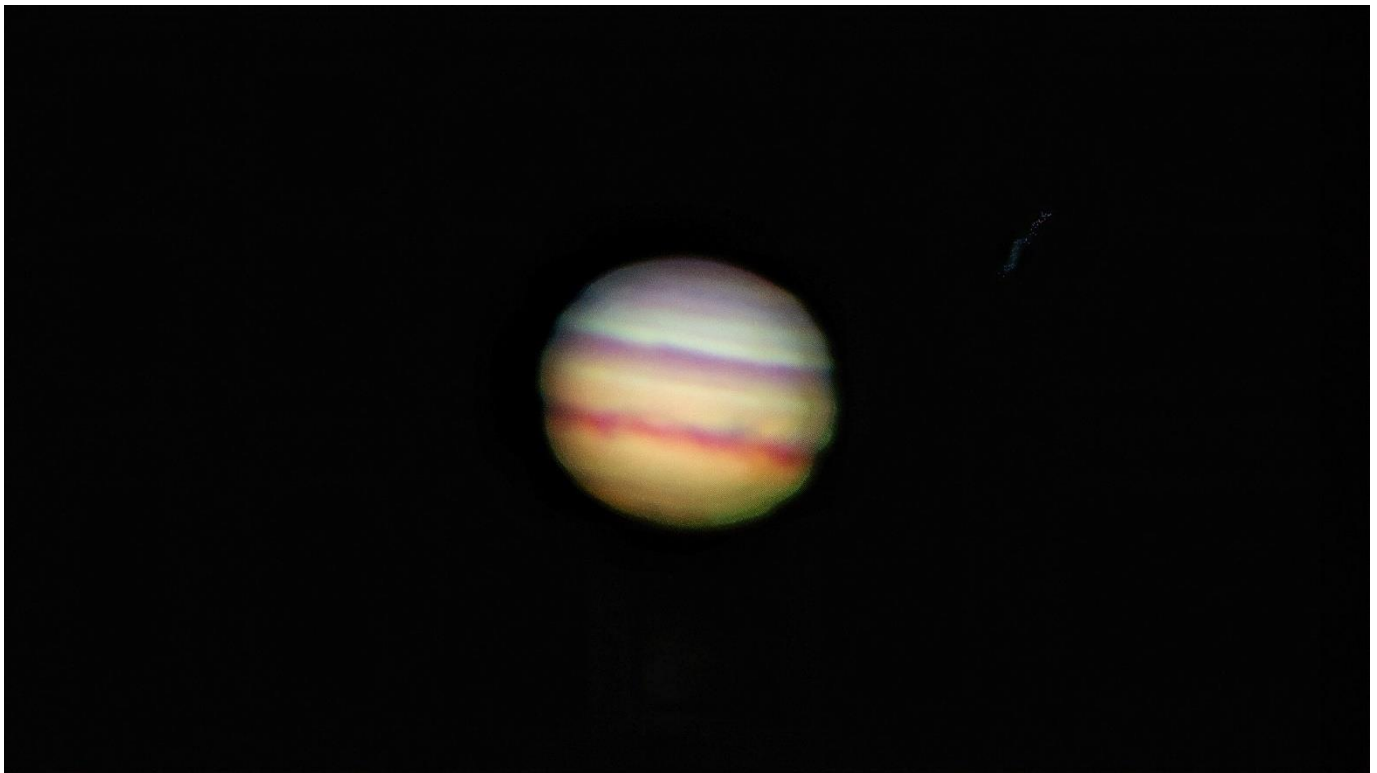


Photo Credit: Jupiter, Courtesy Joel Cohen imaged from Prescott Valley, 2020.

The planet Mercury is a unique specimen within our solar system. Orbiting every 88 days, this closest rocky body to our Sun has no geological activity and virtually no atmosphere. Its surface is pockmarked with testimonies of destruction, and with nothing to erode the signs of billions of years of impact events, making it a dense, grey, blemished world. The ancients knew of Mercury, and many cultures named it relative to its proximity to the Sun and its quick movements across the sky. Being so close to the Sun, Mercury is often not visible to terrestrial viewers,

however on the morning of January 12th Mercury will be 23.5 degrees from the Sun, its Greatest Western Elongation. Look to the Eastern Horizon in the hour before sunrise to catch a view of this elusive wanderer.

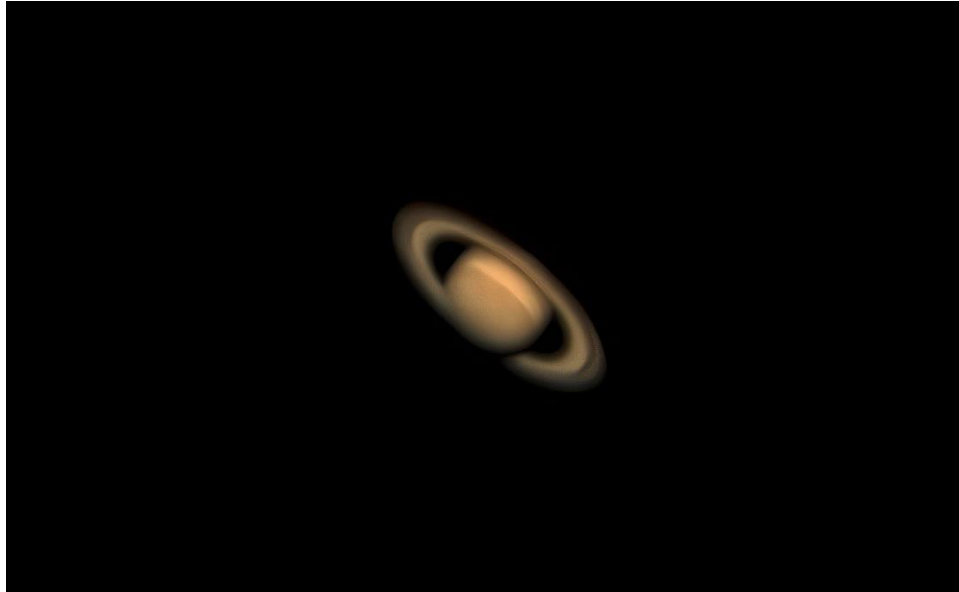


Photo Credit: Saturn, Courtesy Joel Cohen imaged from Prescott Valley, 2020.

On the evening of January 14th, Saturn will make a close approach to the Moon in the constellation Aquarius. To astrologers, this lunar conjunction with the ringed planet may impart a pragmatic and practical approach to financial stability, however, to astronomers it means a fun opportunity to observe the waning crescent moon next to the famous rings of Saturn. Binoculars or a small telescope is all that you need for this event, with just 40x magnification to resolve the rings separate from the planet. The waxing crescent phase is also a great time to look at the highlighted craters of the moon. Get out early this evening, as Saturn will begin to set in the Western hills around 8 PM.

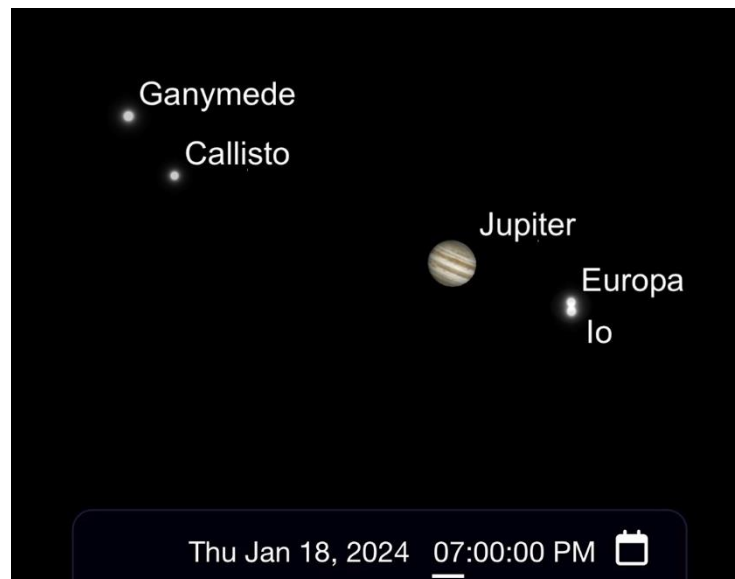


Photo Credit Galilean Moons, SkySafari, 1/18/2024.

Just a few nights later on the evening of January 18th, Jupiter will make its close approach to the Moon in the constellation Aries. A first quarter Moon will spend the evening with the King of Planets, and your binoculars or small backyard telescope should be able to resolve the four Galilean moons: Ganymede, Callisto, Europa, and Io. Those last two, Europa and Io, will be having a conjunction of their own that night, passing extremely close to one another as viewed from Earth. With larger scopes of 100mm or more, and the blessing of a clear night, you may be able to observe the red and white bands of clouds that circle the planet, as well as its most defining feature – the Great Red Spot. Like a high-pressure hurricane, this storm averages 1.3x the diameter of Earth, with wind speeds up to 432 km/h or 268 mph. If early astronomical observations were correctly recorded of the same storm, then it has been in existence since at least 1665.

Adam England is the owner of Manzanita Insurance and Accounting and moonlights as an amateur astronomer, writer, and interplanetary conquest consultant. Follow him @ [Facebook.com/BackyardAstronomerAZ](https://www.facebook.com/BackyardAstronomerAZ) and [Instagram.com/TheBackyardAstronomerAZ](https://www.instagram.com/TheBackyardAstronomerAZ).



In the Know

Original Photo: George Desipris

What You Should Consider When Buying a Telescope

By Lisa Anderson

My first serious introduction to Astronomy took place in the 1990's, when my husband and I moved outside of the big city. We quickly learned there were stars! Lots of stars and we could see them from our backyard. My very nice husband brought me a small refractor, plus a star map and ephemeris for my birthday.

I scanned around the skies, and tried to understand the map/ephemeris, but quickly realized I really needed help, so I enrolled in an astronomy lab class at the local college. I learned about the sky, constellations and how to read star maps. I was also afforded the opportunity to use different types of telescopes and mounts, as per the class activities, where we had to search for (and find) different types of celestial objects. My little birthday telescope was not going to satisfy my astronomy interest and I soon bought a 10-inch Dobsonian reflector, which I still have (among others).

There are a lot of telescope options out there, so what should you be considering before making your purchase? In general, bigger is better, but... you must consider the cost and what you can afford. Secondly, how much does it weigh and how easy is it to assemble or set up? And lastly, what are you interested in looking at? Do you want to observe planets and the moon, or even the Sun? Does your interest lie beyond our solar system with galaxies and nebulae? Are you interested in astrophotography? These answers will determine the best scope for you.

There are three basic types of telescopes:

Refractor: a lens collects the light — these tend to be heavier and expensive but are great for planetary observation.

Reflector: a mirror collects the light — you can acquire a larger scope with more light gathering power for your deep sky objects.

Schmidt-Cassegrain: uses a mirror and a "lens" compressed into a small space. These are considered general purpose. (*Note there are various Cassegrain types*).

There are two different types of telescope mounts:

A German equatorial mount, which must be aligned with Polaris and depending on where your object is located, it can be uncomfortable to view. These are best for astrophotography. **Altazimuth** moves around the horizon up down and side to side.

Personally, I would recommend a Dobsonian telescope for beginners. They are extremely easy to use with the alt-azimuth mount and they come in several different sizes (diameters), affording you a larger size for a relatively smaller price. Additionally, there is practically no set up involved. This type of scope allows the user to easily scan around and familiarize themselves with the sky and all the wonders it has to offer.

Lisa's Reality checks:

1. You will not see objects through your telescope that look like a picture. Your eyes do not have the ability to pick up all those photons. The photographs one sees are often taken for long periods of time or combined or stacked with multiple images or even multiple scopes.

2. You can use a computer device to find your celestial object, but each time you look at an unmodified screen on a phone or computer, you are ruining your dark adaptation and diminishing the number of stars you can see. Try learning the constellations which is not so difficult and can be very satisfying to look up and see patterns.

3. Just because a telescope advertises to possess all the bells, buzzers and whistles, doesn't mean it is for you. The best scope for you is the one you can and will use to observe the heavens. Sometimes simpler is better.

If you need advice or have questions, please ask a board or club member. We would love to help and want you to be successful with your hobby. If you choose to pursue astrophotography, you have plenty of company within the club and the board. Attend a star party and look through member scopes. Most amateurs enjoy sharing their hobby. I urge you to ask.



Original Photo: Zukiman Mohamad

David Visco Photos

The images were taken with a Celestron C6 SCT with 1.6x amplifier (2805mm focal length, $f/18.7$) and Flea3 monochrome video camera. 5-minute videos were captured. The videos were processed in Autostakkert!, stacking 400 of the best frames in each video. The stacked images were wavelet processed in Registax 6. Final optimization was performed in Adobe Photoshop CS6.

The Alps Mountains bisected by the Alpine Valley
09/16/2021



Photo Credit: David Visco

The crater triplet of Catharina, Cyrillus and Theophilus
09/13/2021

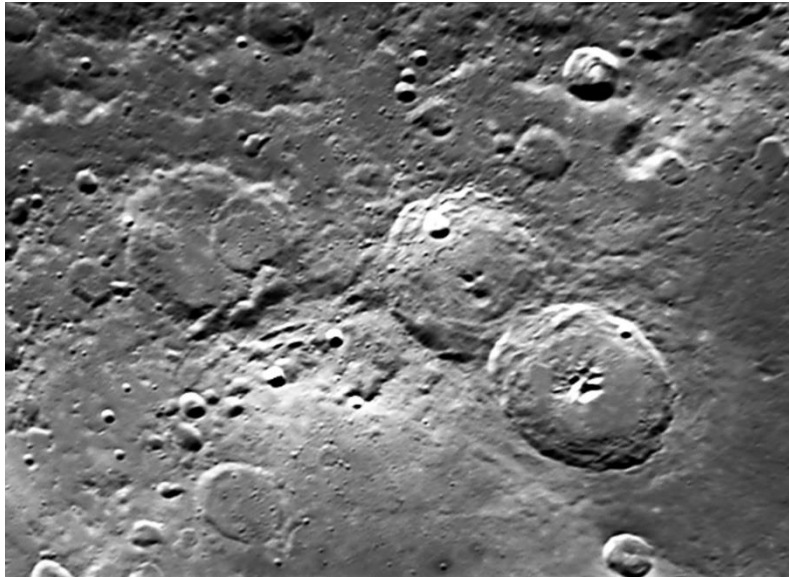


Photo Credit: David Visco

Clavis
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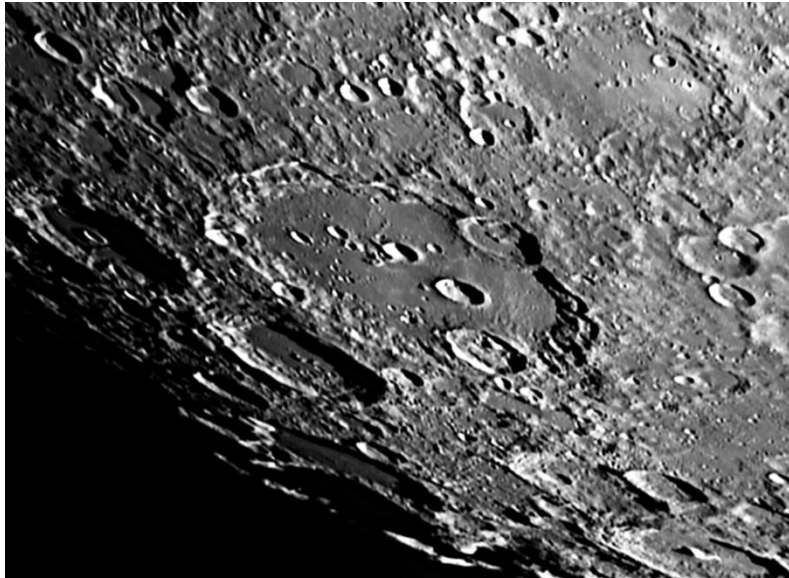


Photo Credit: David Visco

Tycho
09/16/2023



Photo Credit: David Visco

Calendar of Events

Original Photo: Camille Cox

January 2024:

This calendar is from In-the-Sky.org & shows the objects & events visible during January 2024.

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	1 Moon at Apogee	2 Cluster Messier 41 is Well-Placed Earth at Perihelion	3 Last Quarter Moon	4 Quadrantid Meteor Shower 2024	5	6
7 Mercury at Dichotomy Mercury at Highest Altitude in Morning Sky	8 Lunar Occultation of Antares Conjunction of Moon & Venus	9 Conjunction of Moon & Mercury	10 Moon at Perihelion Conjunction of Moon & Mars	11 New Moon	12 Mercury at Greatest Elongation West	13 Moon at Perigee
14 Conjunction of Moon & Saturn Close Approach of Moon & Saturn	15 Lunar Occultation of Neptune Cluster Messier 47 is Well-Placed NGC 2403 is Well-Placed	16 Conjunction of Venus & Ceres	17 Cluster NGC 2451 is Well-Placed First Quarter Moon	18 Close Approach of Moon & Jupiter Conjunction of Moon & Jupiter	19 Y-Ursae Minorid Meteor Shower 2024 Asteroid 354 Elornora at Opposition	20 Close Approach of Moon & M45 134340 Pluto at Solar Conjunction Cluster NGC 2516 is Well-Placed
21	22 Lunar Occultation of Beta Tauri	23	24 Cluster NGC 2547 is Well-Placed	25 Full Wolf Moon	26 Moon at Apihelion	27 Uranus Ends Retrograde Motion Conjunction of Mercury & Mars Close Approach of Mercury & Mars

28	29 Moon at Apogee	30	31 Beehive Cluster is Well-Placed Omicron Velorum is Well-Placed			
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Call for Images & Ideas

Original Photo: Egil Sjøholt

We'd Love Your Photos & Ideas for the Newsletter!

I am requesting any & all photographer members of PAC to submit astronomical &/or sky photographs to share with all the members by their inclusion in Ephemeris. Images can be sent to Hilary Legacy at ed@prescottastronomyclub.org. Please include descriptions of equipment, cameras, image capture parameters & processing, as well as what's in the image, & when & where you took it. Or, for anyone who likes to photo edit or make their own images, I'd love to hear from you too. Thanks!

I'm also asking for anyone with ideas of things we could put in our newsletter to contact me. If there's something you'd like to see here, then tell me about it. Email Hilary Legacy at ed@prescottastronomyclub.org.

Observing Lists

Original Photo: Joonas Kääriäinen

Observing lists are available in PDF format on the PAC website to provide guidance & goals for visual & astrophotography programs. This list These lists graciously provided by Past President David Viscio to assist in planning your observation activities.

SCAVENGER HUNTS IN THE SKY Lists for Any Occasion

Need ideas for your visual or astrophotography program? We have you covered with observing lists for your personal exploration or use at a star party.

Click on the links below to open an observation list in another window to view or print it.

[Astroleague Lunar 100](#)

[Astroleague Urban](#)

[Binocular Showpieces](#)

[Bright Nebulae](#)

[Caldwell Objects](#)

[Double Stars](#)

[Dunlop 100 \(Southern Hemisphere\)](#)

[Face-On Spiral Galaxies](#)

[Globular Clusters](#)

[Herschel 400](#)

[Herschel II](#)

[Hidden Treasures](#)

[Messier Objects](#)

[Open Clusters](#)

[Planet Maps](#)

[Planetary Nebulae](#)

[RAS of Canada Finest NGC](#)

[Saguaro Astronomy Club Best NGC](#)

[Secret Deep](#)

[Space & Telescope Lunar 100](#)

[Telescope Showpieces by Month](#)



PAC Business

Original Photo: Tobias Björkli

PAC Board of Directors:

President: Art Arnold-Roksandich
Vice-President: Brian Blau
Secretary: Jack Evans
Treasurer: Roland Albers

PAC Directors-at-Large:

Ken Olson
Doug Tilley
Susanne Vaughan
Lisa Anderson

PAC Coordinators:

Astronomical League Coordinator: Ken Olson
Christmas Party: Susanne Vaughan
Equipment Loans: Roland Albers
Membership: Roland Albers
METASIC: John Dwan
Newsletter: Hilary Legacy
Night Sky Network: Open
Outreach Coordinator: Brian Blau
Refreshments: Jill Albers
Speakers: Lisa Anderson
Starry Nights Coordinator: Brian Blau
Summer Picnic: Doug Tilley
Webmaster: EJ Van Horne

PAC Contact Information:

Website: <https://www.prescottastronomyclub.org>

Email: pacinfo@prescottastronomyclub.org

PAC Mentors:

If you need advice on the purchase of astronomy equipment, setting up equipment, astrophotography, etc., contact a PAC mentor.

Astrophotography: Brian Blau

General & Astrophotography: David Viscio

Visual Observation: Greg Lutes



Need to Know?

Original Photo: Jeremy Müller

Ask a Member!

A 15-minute segment is being added to the regular general meetings where members can have their burning questions answered by other knowledgeable members. If you have an astronomy-related question you would like answered, submit it to Art Arnold-Roksandich at p@prescottastronomyclub.org. You can also bring up the question at the meeting.