



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.

August 2023



Original Photo: Lucas Pezeta

General Meeting of the Prescott Astronomy Club

Wednesday, August 2, 2023, at 6:00pm
Prescott Public Library - Founders Room

Swap Meet: Bring your own gear to SELL or TRADE! Also featuring items from the club's inventory including telescopes, astronomy equipment, accessories and books.

Member Presentations: Volunteer to present information about your recent astronomy activities. Show your astrophotos, present an astro trip report, or talk about a recent interesting observation.

PAC Members – Annual Picnic

Saturday, August 19, 2023, from noon - 3pm
Big Pavilion overlooking Watson Lake

The annual PAC Picnic is Saturday, August 19th, from noon to 3pm at the Big Pavilion (with red roof) overlooking Watson Lake. Bring your own beverages and a dish to share. Brats and burgers will be provided.

Please RSVP!

Let our secretary know if you are coming (and bringing a friend or spouse) by August 10th. *We need a head count to purchase food and your parking pass!* Send your RSVP to: s@prescottastronomyclub.org.

General Meeting of the Prescott Astronomy Club

Wednesday, September 6, 2023, at 6:00pm
Prescott Public Library - Founders Room

Speaker: Dr. Nick Moskovitz, Lowell Observatory, Flagstaff, Arizona

Topic: Earth strikes back: NASA's first planetary defense experiment (DART follow-up)

Background: Late 2022 NASA's DART spacecraft deliberately crashed into an asteroid at a speed of more than 13,000 mph. Given this dramatic end, ground based telescopes, including several at Lowell Observatory, will be tasked with witnessing the aftermath. I will discuss background to the DART mission, what is expected to happen, and why smashing into things in outer space can be fun.

Bio: Dr. Nick Moskovitz is an astronomer at Lowell Observatory in Flagstaff, Arizona. He has degrees from the University of California at Santa Barbara (BS Physics) and the University of Hawaii (PhD Astronomy). His research is related to small bodies in the Solar System with active projects involving video observations of meteors, curation of an asteroid database (asteroid.lowell.edu), and observations of near-Earth asteroids.

General Meeting of the Prescott Astronomy Club

Wednesday, October 4, 2023, at 6:00pm
Prescott Public Library - Founders Room

Speaker: TBA
Topic: TBA

Partial Eclipse Viewing

October 14, 2023, Time to Come
Location to Come

Details to Come

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 (@110 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 out 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.

Leadership Team	Volunteers to fill the positions of President and possibly a board member. Nominations are due by the October meeting and the election in November. Contact Doug Tilley dougbt51@gmail.com
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



Original Photo: unknown

Super Blue Sturgeon Moon

By Vivian White

On August 1st, catch a **full Moon** rising in the east just 30 minutes after sunset. We are seeing the entire sunlit side of the Moon as it is nearly (but not quite) in line with the Sun and Earth. The *Farmers' Almanac* calls this month's Moon the "Sturgeon Moon", for the time of year when this giant fish was once abundant in the Great Lakes. Cultures around the world give full Moons special names, often related to growing seasons or celebrations.

As the Moon rises later and later each night, the bright sunlit part appears to get smaller or "wane" - we call this a waning **gibbous Moon**. About a week later, on August 8th, we see only one half of the Moon alight. At this phase, the Moon rises around midnight and sets around noon. Have you ever seen the Moon in the daytime? You may notice this phase towards the southwest in the morning sky. Hold up a ball or egg beside it and see how the Sun lights up the same part.

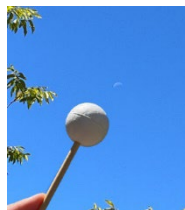


Photo Credit: Vivian White.

Image of waning crescent Moon shown next to a ball on a stick that is lit by the Sun on the same side as the Moon, with trees and a blue sky in the background. Try this with an egg or any round object when you see the Moon during the day!

By August 16th, the Moon has gone through its crescent phase and is now only showing its dark side towards the Earth. Did you know the **dark side** and the **far side** of the Moon are different? The Moon always shows the same face towards Earth due to the gravitational pull of Earth, so the far side of the Moon was only viewed by humans for the first time in 1968 with the Apollo 8 mission. However, the dark side is pointed at us almost all the time. As the Moon orbits the Earth, the sunlit side changes slowly until the full dark side is facing us during a **new Moon**. When the Moon is just a small crescent, you can sometimes even see the light of an **Earthshine** reflecting off Earth and lighting up the dark side of the Moon faintly.

Then as the Moon reappears, making a waxing (or growing) **crescent Moon**, best seen in the afternoons. By the time it reaches the first quarter on August 24th, we see the other half of the Moon lit up. At this point, the Moon passes through Earth's orbit and marks the spot where the Earth was just 3 hours prior. It takes the Earth about 3 hours to move the distance between the Moon and Earth.



[Earthshine as seen from the International Space Station](#) with the sun just set — Astronaut Photograph ISS028-E-20073 was taken on July 31, 2011, and is provided by the ISS Crew Earth Observations Facility and the Earth Science and Remote Sensing Unit, Johnson Space Center.

The Moon on August 30th is referred to as a blue moon. **Blue moons** are not actually blue in color of course; it refers to the second full Moon in any month. Since it takes 29.5 days to complete the cycle from full to new and back to full, most months will see only one. But occasionally, you'll fit two into one month, hence the phrase "once in a blue moon." We see a blue moon about once every 3 years on average - next in May 2026. In addition, this full Moon appears larger in the sky than any other full Moon this year - an unofficial **supermoon**. A supermoon appears larger than average because it is closer in its slightly elliptical orbit. The difference in apparent size between the smallest and largest full Moon is about the size difference between a quarter and a nickel. Even at its largest, you can always cover the whole Moon with your pinky extended at arm's length.

Follow the Moon with us this month and keep a Moon journal if you like - you may be surprised what you discover! moon.nasa.gov/moon-observation.

Backyard Astronomer



Original Photo: Eberhard Grossgasteiger

The Backyard Astronomer - August 2023

Celestial Neighbors

By Adam England, The Backyard Astronomer

August hosts a plethora of lunar and planetary events, perfect for the Backyard Astronomer. Even the most basic binoculars or telescope will allow one to enjoy our celestial neighbors as they put on quite the display this month.

August 1st starts off the month with a Full Supermoon. The second Supermoon this year, this event occurs when the Moon appears slightly larger in the sky due to its proximity to Earth in its elliptical orbit. While there is no strict definition of a Supermoon, it is commonly accepted that the moon be within 90% of perigee, or the closest approach of its orbit to Earth. By contrast, the furthest part of an elliptical orbit is called the apogee, and the Moon's distance from Earth can sway from about 405,500 km to as close as 363,400 km, or about 252,000 miles to 225,000 miles. This full moon was also known in the Great Lakes regions as the Sturgeon Moon, for its timing correlated with the preferred fishing season.

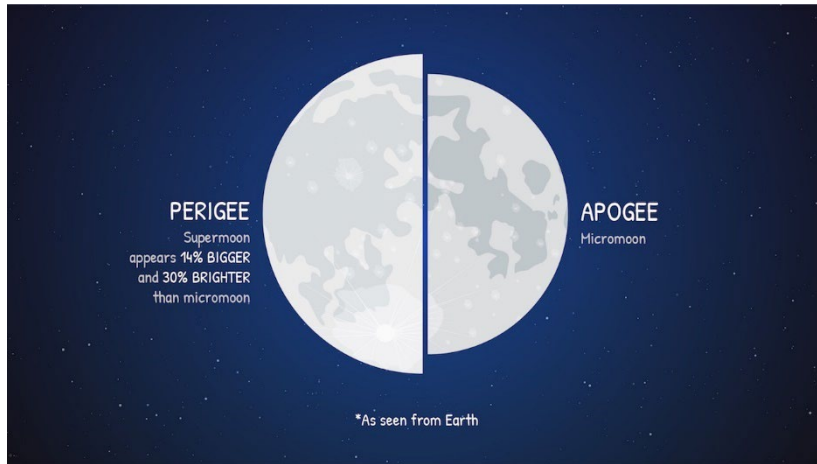


Photo Credit: Perigee vs Apogee courtesy of NASA.

On August 10th, Mercury will be at greatest Eastern elongation from the Sun, meaning it is as high in the evening sky as we can see it, before it begins to move back around the Sun. “Eastern Elongation” may seem like a misnomer, referencing where the planets are in relation to each other, however you will look to the Western horizon just after sunset. This is the best day of the year to catch a glimpse of the elusive owl whom the Maya regarded as a messenger to the underworld.

In the early hours between August 12th-13th the Earth will pass through the tail of comet Swift-Tuttle. Having last visited the inner solar system in 1992, and not returning until 2126, the debris cloud of dust and ice particles affords the annual Perseids Meteor Shower, with excellent viewing this year as the moon will only be a crescent. Enjoy this show after midnight when you may catch upwards of 60 meteors per hour.

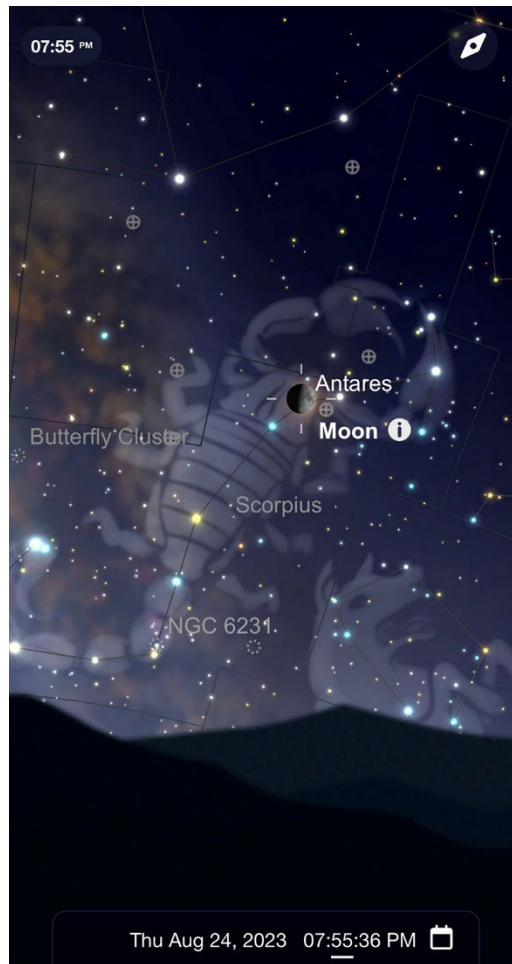


Photo Credit: Lunar Occultation of Antares – SkySafari.

On August 24th, the bright red head of the Scorpius will be eclipsed by the moon. This rare event will see the occultation of Antares by the moon, disappearing behind the moon at 6:55 PM MST and reappearing an hour later at 7:55PM.

Saturn puts on a show on August 27th, at what we call Opposition. Saturn will be at its closets to Earth on this night, and fully illuminated by the Sun directly opposite it. Moving through the constellation Aquarius in the Southern sky, a medium sized telescope will allow you to see the rings and maybe even its moon Titan.

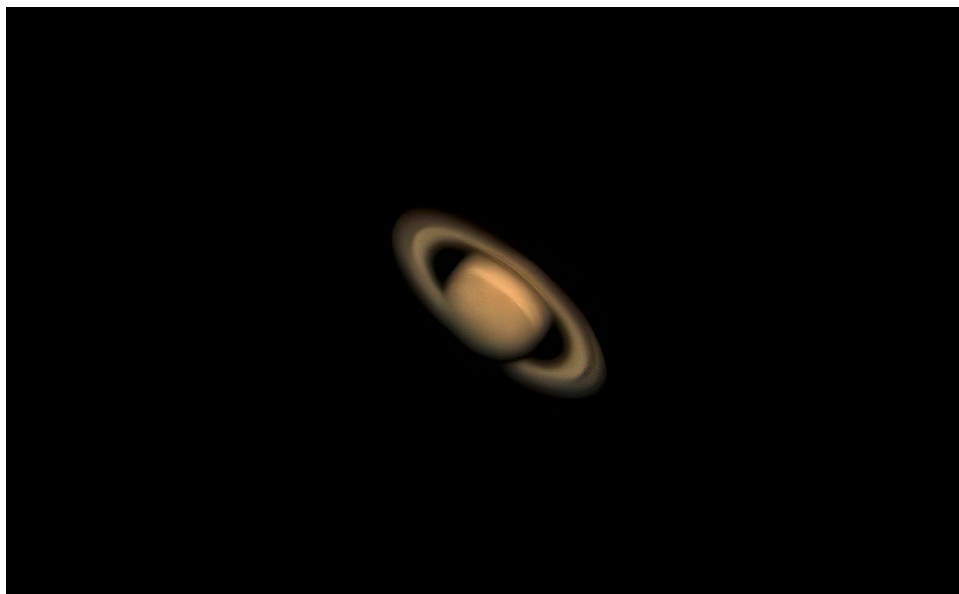


Photo Credit: Saturn – Courtesy Joel Cohen, Prescott Valley, 2020.

Wrapping up the month of August on the evening of the 31st is the second Supermoon of the month. When two full moons occur in the same calendar month, we call the second one a Blue Moon. This Moon won't really appear blue but is a relatively rare event to have both full moons in a single month be Supermoons.

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).



Original Photo: Zukiman Mohamad

Summer Starry Nights

PAC held its first summertime star party in July just before the monsoons and evening clouds impact telescope observing conditions. While we usually plan club star parties well in advance, this time we only gave 4 days' notice as we wanted to better understand the weather forecast. The location was Williamson Valley Trailhead which is a new place for the club to hold events, and it's a good spot for dark sky conditions. Thanks to everyone, club members and guests, for coming out!





Photo Credits: Brian Blau.

Calendar of Events

Original Photo: Camille Cox

August 2023:

This calendar is put together from several sources & shows the objects & events visible during August 2023.

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
		1 Full Moon (Sturgeon Moon)	2 Moon at Perigee	3 Conjunction of Moon & Saturn Close Approach of Moon & Saturn	4	5
6	7	8 Last Quarter Moon Venus at Aphelion Conjunction of Moon & Jupiter	9 Close Approach of Moon & M45 Mercury at greatest elongation Mercury at Dichotomy	10 Mercury at Aphelion Asteroid Hygiea at Opposition	11	12

		Close Approach of Moon & Jupiter				
13 Perseid Meteor Shower 2023 Venus at Inferior Solar Conjunction	14 Messier 15 is Well-Placed	15 Messier 2 is Well-Placed	16 New Moon Moon at Apogee	17	18 Moon at Perihelion Conjunction of Moon & Mercury κ-Cygnid Meteor Shower 2023 Conjunction of Moon & Mars Close Approach of Moon & Mars	19
20	21	22	23	24 First Quarter Moon Lunar Occultation of Delta Scorpii Lunar Occultation of Antares	25	26 Asteroid 8 Flora at Opposition
27 Saturn at Opposition	28 Uranus Enters Retrograde Motion	29 Moon at Aphelion	30 Blue Moon Moon at Perigee Conjunction of Moon & Saturn Close Approach of Moon & Saturn	31		

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. The lists are in PDF format and may be viewed, downloaded or printed with the permission of David Viscio.

Astroleague Lunar 100
Bright Nebulae Dunlop 100.
Globular Clusters
Messier
Planet Maps

Binocular Showpieces Caldwell
Face-On Spiral Galaxies
Herschel II
Herschel 400

Royal Astronomical Society of Canada Finest NGC Saguaro Astronomy Club Best NGC S&T

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](#)

Get to Know . . .

Original Photo: Rajesh S. Balouria

What You Need to Know About Astronomy Apps

By Hilary Legacy

I hope you enjoyed last month's review of the [Moon Phase App](#). There are many astronomy apps available on both the Apple & Android platforms, but not all are created equal. Each offers different functions & information, each with a different design & style. Some focus on constellations & stars, others on the moon, yet others on education. I'll begin with the ones I have, one per month, & then other apps will follow in the next issues.

Sun & Moon App

This app gives you the ability to see where the sun, moon & other planets are today, or where they were or will be on past & future days. The top of the screen gives your GPS location, followed below by the date, which has a backward button on its left (past) & a forward button on its right (future). Most of the screen shows you what the camera is looking at & will identify the location of the sun & moon in the sky. Then, at the bottom of the screen, are five buttons (from left to right): a button that lets up upload photos to text messaging, email or social media; a button that turns the camera off; a button that reads AR & allows you to zoom into the image you're viewing; an information button that tells you things about the app as well it's "sister" apps; & a settings button, which takes you to your phone's settings. Then, on the left, it lists its stats for the sun (the time it rises & sets, how many hours of daylight, where in the sky it is & it's longitude & latitude) & on the right is the settings for the moon (when it rises & set, what phase it's in, when & what time it'll be full again, it's miles from the Earth & it's brightness %, & it's latitude & longitude). This app doesn't have any educational articles or great images but has very specific information. It has its good points but is limited.

Next month I'll begin to review some apps I don't currently have. I hope this column gives you a good look at some of the astronomical apps out there!



Original Photo: Samer Daboul

These are photographs by non-PAC members that you might enjoy.



Photo Credit: Unknown.



Photo Credit: Wendy Williams.



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
EJ Van Horne

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



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.