Prescott Astronomy Club

# 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.

## February 2024


Original Photo: Lucas Pezeta

## Prescott Astronomy Club Meeting

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

**Speaker:** Kevin Schindler from the Lowell Observatory, *Dark Skies Over Arizona*

**Topic:** Dark skies are a disappearing resource. This session will look at the benefits of dark skies, how Arizona has helped lead the charge to protect them, and how we all can do our part in reducing artificial light pollution.

**Bio:** Kevin Schindler is the historian at Lowell Observatory where he has worked for 28 years as an active member of the Flagstaff history and science communities.

## Prescott Astronomy Club Meeting

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

**Speaker:** Charity Woodrum from University of Arizona Steward Observatory, *JWST & NIRCam*

**Topic:** She will discuss humanity's most powerful telescope, the James Webb Space Telescope (JWST). The mission of JWST is to study the first stars and galaxies in the early Universe, the formation and evolution of galaxies across cosmic time, the birth of stars and protoplanetary systems, and the atmospheres of exoplanets. In her talk, she will discuss these science goals, as well as JWST's journey to space, some of her favorite images that have been released, and some of the most exciting scientific results that have been submitted for publication thus far.

**Bio:** Charity Woodrum is a Doctoral Candidate and National Science Foundation Graduate Research Fellow at the University of Arizona's Steward Observatory working under the supervision of Professor Marcia Rieke. She is also a member of NASA's James Webb Space Telescope Near Infrared Camera (NIRCam) science team and the JADES collaboration. She earned her B.S. in Physics at the University of Oregon.

# Prescott Astronomy Club Meeting

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

**Speaker:** Dr. Jason Barnes of the University of Idaho, *NASA's Rotorcraft Lander Mission to Saturn's Moon Titan*

**Topic:** Dragonfly is a robotic octocopter space mission heading to Titan, the giant moon of Saturn. Dragonfly will land on the surface of the hazy moon to explore prebiotic chemistry, to evaluate its habitability, and to look for chemical biosignatures.

**Bio:** Dr. Barnes studies the physics of planets and planetary systems. He uses NASA spacecraft data to study planets that orbit stars other than the Sun and the composition and nature of the surface of Saturn's moon Titan. He is Deputy Principal Investigator on the Dragonfly NASA space mission, which will land a robotic rotorcraft on Titan in 2034.

# 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.<br>Dark Sky Promotion - increase public awareness for preserving dark skies.<br>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

# Constant Companions: Circumpolar Constellations, Part I

By Kat Troche

Winter in the northern hemisphere offers crisp, clear (and cold!) nights to stargazers, along with better views of several circumpolar constellations. What does circumpolar mean when referring to constellations? This word refers to constellations that surround the north and south celestial poles without ever falling below the horizon. Depending on your latitude, you will be able to see up to nine circumpolar constellations in the northern hemisphere. Today, we'll focus on three that have gems within: **Auriga, Cassiopeia, and Ursa Minor**. These objects can all be spotted with a pair of binoculars or a small to medium-sized telescope.

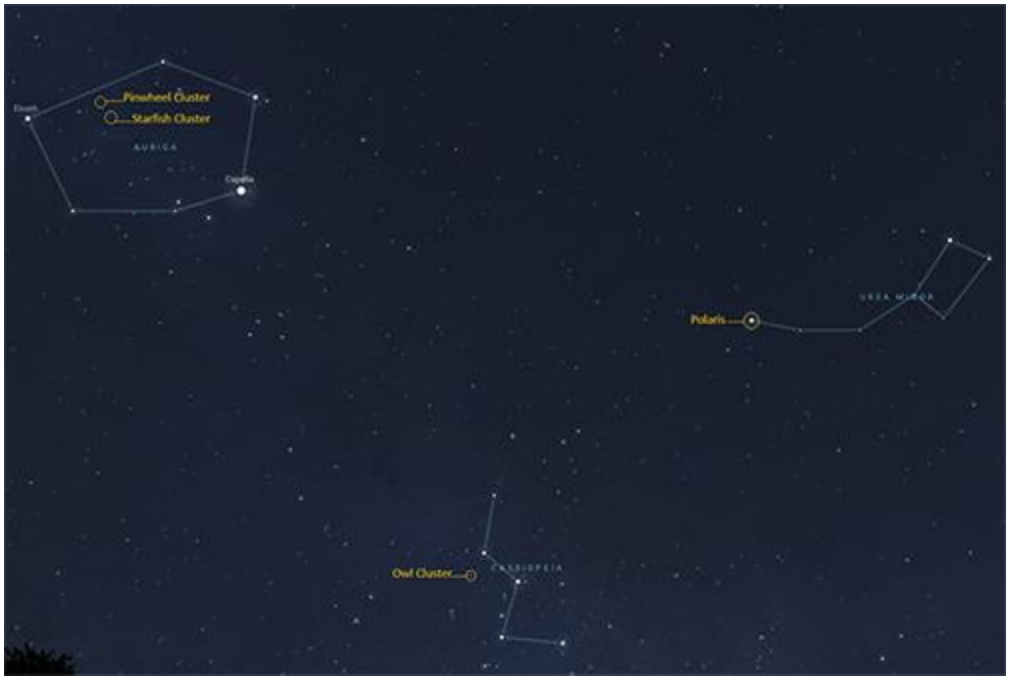


Image Credit: Stellarium Web

The counterclockwise circumpolar constellations Auriga, Cassiopeia, and Ursa Minor in the night sky, with four objects circled in yellow labeled: Pinwheel Cluster, Starfish Cluster, Owl Cluster, and Polaris.

- **The Pinwheel Cluster:** Located near the edge of Auriga, this open star cluster is easy to spot with a pair of binoculars or small telescope. At just 25 million years old, it contains no red giant stars and looks similar to the Pleiades. To find this, draw a line between the stars Elnath in Taurus and Menkalinan in Auriga. You will also find the **Starfish Cluster** nearby.
- **The Owl Cluster:** Located in the 'W' or 'M' shaped constellation Cassiopeia, is the open star cluster known as the **Owl Cluster**. Sometimes referred to as the E.T. Cluster or Dragonfly Cluster, this group of stars never sets below the horizon and can be spotted with binoculars or a small telescope.

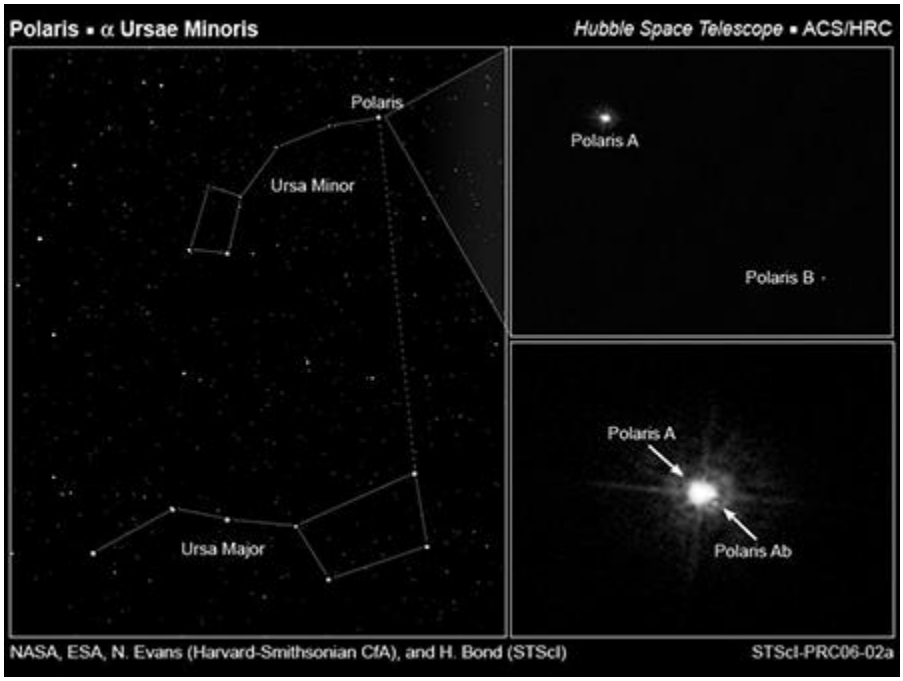


Photo Credit: NASA, ESA, N. Evans (Harvard-Smithsonian CfA), and H. Bond (STScI)

A black and white image from the Hubble Telescope of the Polaris star system, showing three stars: Polaris A, Ab, and Polaris B.

- **Polaris:** Did you know that Polaris is a triple star system? Look for the North Star on the edge of Ursa Minor, and with a medium-sized telescope, you should be able to separate two of the three stars. This star is also known as a *Cepheid variable star*, meaning that it

varies in brightness, temperature and diameter. It's the closest one of its kind to Earth, making it a great target for study and conceptual art.

Up next, catch the King of the Planets before its gone for the season with our upcoming mid-month article on the Night Sky Network page through NASA's website!


**Original Photo:** Eberhard Grossgasteiger

## The Backyard Astronomer – February 2024

# Unicorns & Roses

### By Adam England, The Backyard Astronomer

A lesser-known and relatively modern constellation occupies the void between Orion, Canis Major, Hydra and Gemini, though the stars are difficult to see with the naked eye due to modern light pollution. Monoceros – *mono* meaning "one" and *ceros* meaning "horn" – the Unicorn is a simple 7-point constellation, though only two of the stars are usually discernible without the aid of binoculars or a telescope. Coined by Dutch cartographer Petrus Plancius in the 17th century, Monoceros contains many intriguing objects for the amateur observer.

**Photo Credit:** Rosette Nebula, Courtesy N.A Sharp, NOIRLab, Wikimedia Commons.

The nose of the unicorn is quite easy to locate. Start with the bright orange shoulder of Orion, the easily identifiable star Betelgeuse and the dimmer blue star Meissa that marks the Hunter's head. Draw a line from Meissa to Betelgeuse, continuing nearly that same distance again to the Southeast of Betelgeuse to find the binary system **ε Monocerotis,** denoting the nose of the unicorn. Just a slight look continuing to the east will place the Rosette Nebula in your view.

**Image Credit:** Orion and Monoceros, SkySafari, 2/15/2024.

About 5,200 lightyears distant, the Rosette Nebula takes its name from the stylized floral design, often seen as a textile rose awarded for competitions. English astronomer John Flamsteed first noted the nebula in 1690, noting its circular shape and dark center, reminiscent of a rose. Approximately 130 lightyears across, this emission nebula is a star nursery, estimated at a mass of more than 10,000 solar masses, or the equivalent of 10,000 of our suns. The intense radiation of the juvenile stars in this densely packed space excites the molecules in the clouds of gas and dust around them, off putting more and more radiation in a chain of events that continuously sends ever increasing quantities of ultraviolet and x-ray radiation in all directions. For us, this equates to a beautiful nebula, perfect for our viewing pleasure. At apparent magnitude of 9.0, even small telescopes can resolve this stellar breeding ground.

Enjoy the Rosette Nebula, Monoceros, and the Orion constellation in the Southern sky in the early hours of the evening throughout the month of February. Wishing you clear skies!

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 and Instagram.com/TheBackyardAstronomerAZ.

**Original Photo:** George Desipris

# Binoculars: A Great First Telescope

Do you want to peer deeper into the night sky? Are you feeling the urge to buy a telescope? There are so many options for budding astronomers that choosing one can be overwhelming. A first telescope should be easy to use and provide good quality views while being affordable. As it turns out, those requirements make the first telescope of choice for many stargazers something unexpected: a good pair of binoculars!

Binoculars are an excellent first instrument because they are generally easy to use and more versatile than most telescopes. Binoculars can be used for activities like stargazing and birdwatching and work great in the field at a star party, along the hiking trail, and anywhere else where you can see the sky. Binoculars also travel well since they easily fit into carry-on luggage – a difficult feat for most telescopes!

A good pair of binoculars, ranging in specifications from 7x35 to 10x50, will give you great views of the Moon, large open star clusters like the Pleiades (M45), and, from dark skies such as in the Prescott area, larger bright galaxies like the Andromeda Galaxy (M31) and large nebulae like the Orion Nebula (M42). While you likely won't be able to see Saturn's rings, as you practice your observing skills you may be able to spot Jupiter's moons, along with some globular clusters and fainter nebulae from dark sites, too.

What do the numbers on those binocular specs actually mean? The first number is the magnification, while the second number is the size in millimeters (mm) of the lenses. So, a 7x35 pair of binoculars means that they will magnify 7 times using lenses 35 mm in diameter. It can be tempting to get the biggest binoculars you can find but try not to get anything much more powerful than a 10x50 pair at first. Larger binoculars with more magnifying power often have narrower fields of vision and are heavier. While technically more powerful they are also more difficult to hold steadily and usually require a sturdy tripod for best viewing.

Binoculars are able to show a much larger field of view of the sky compared to most telescopes. For example, most telescopes are unable to keep the entirety of the Pleiades or Andromeda Galaxy entirely inside the view of most eyepieces. Binoculars are also a great investment for more advanced observing, as later on they are useful for hunting down objects to then observe in more detail with a telescope.

If you are able to do so, real-world advice and experience is still the best for something you will be spending a lot of time with! Going to an in-person star party hosted by PAC or any local club is a great way to get familiar with telescopes and binoculars of all kinds.

This article is excerpted from the NASA Night Sky Network, a coalition of hundreds of astronomy clubs across the US dedicated to astronomy outreach. Visit nightsky.jpl.nasa.gov to find local clubs, events, stargazing info and more.


Original Photo: Zukiman Mohamad

## David's Lunar Photographs

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.

## Archimedes
09/16/2021

Photo Credit: David Visco

## Copernicus
09/13/2021

Photo Credit: David Visco

## Eratosthenes
09/16/2021

Photo Credit: David Visco

## Plato
09/16/2023

Photo Credit: David Visco


Original Photo: Camille Cox

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

| Sunday | Monday | Tuesday | Wednesday | Thursday | Friday | Saturday |
|---|---|---|---|---|---|---|
| | | | | 1<br>Cluster IC 2395 is Well-Placed | 2<br>Mercury at Aphelion<br>Last Quarter Moon | 3 |
| 4<br>Lunar Occultation of Antares | 5<br>Conjunction of Mercury & Pluto | 6 | 7<br>Conjunction of Moon & Venus<br>Conjunction of Moon & Mars<br><br>PAC Meeting | 8<br>Moon at Perihelion<br>α-Centaurid Meteor Shower 2024<br>Conjunction of Moon & Mercury<br>NGC 2808 is Well-Placed | 9<br>New Moon | 10<br>Moon at Perigee<br>Conjunction of Moon & Saturn |
| 11 | 12<br>Lunar Occultation of Neptune | 13 | 14<br>Comet C/2021 S3 (PANSTARRS) Passes Perihelion<br>Close Approach of Moon & Jupiter<br>Conjunction of Mars & Pluto | 15<br>Conjunction of Moon & Jupiter | 16<br>First Quarter Moon<br>Close Approach of Moon & M45 | 17<br>Conjunction of Venus & Pluto |
| 18<br>Lunar Occultation of Beta Tauri | 19<br>Messier 81 is Well-Placed | 20 | 21<br>Cluster NGC 3114 is Well-Placed | 22<br>Close Approach of Venus & Mars<br>Conjunction of Venus & Mars | 23 | 24<br>Full Snow Moon |
| 25<br>Moon at Apogee | 26<br>Moon at Aphelion | 27<br>Cluster IC 2581 is Well-Placed | 28<br>Mercury at Superior Solar Conjunction<br>Saturn at Solar Conjunction | 29 | | |


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.


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


Original Photo: Samer Daboul

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

Photo Credit: Adi K.

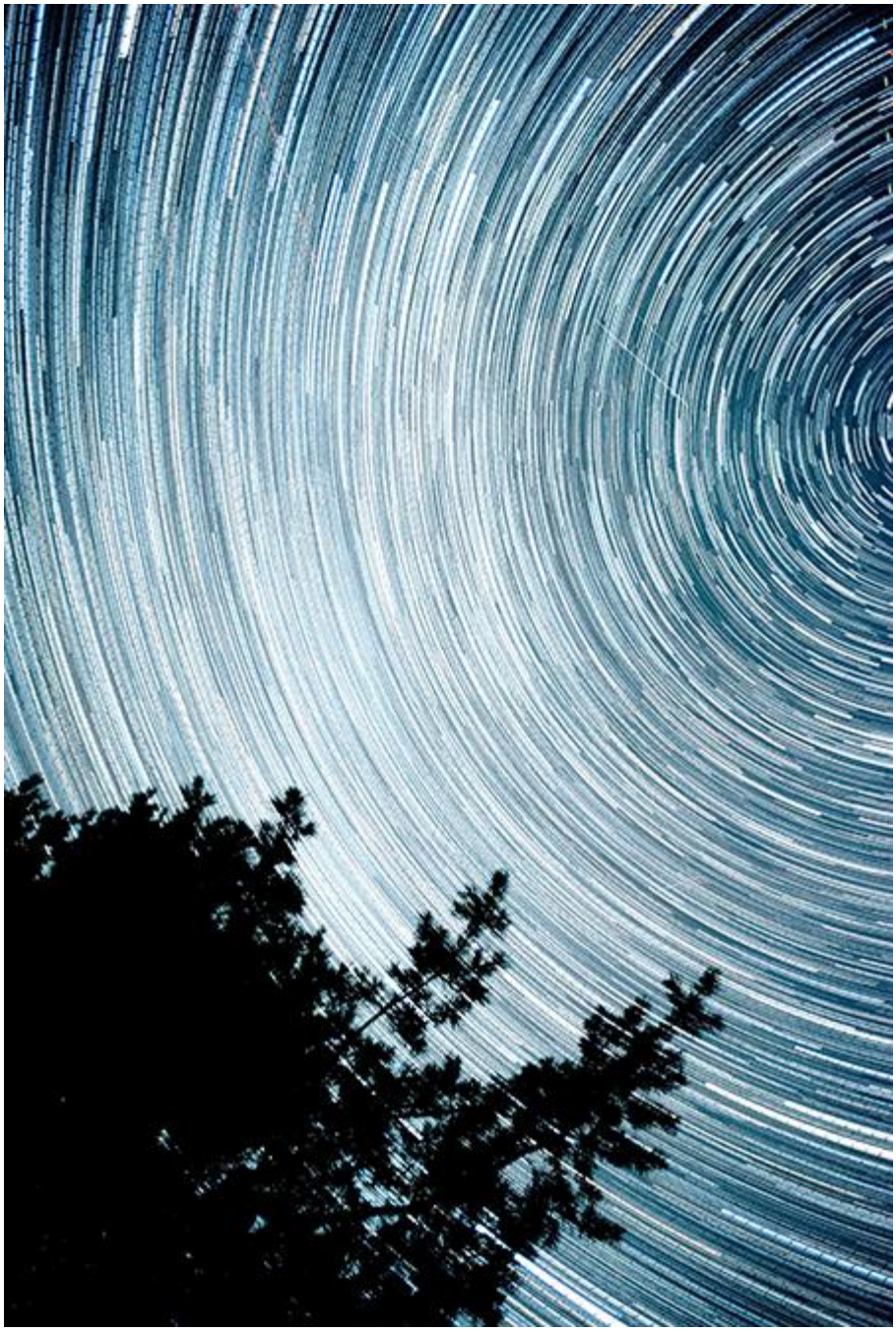

**Photo Credit:** Alexey Chudin


**Original Photo:** Tobias Bjørkli

## PAC Board of Directors:

## PAC Directors-at-Large:

| | |
|---|---|
| **President:** Art Arnold-Roksandich | Ken Olson |
| **Vice-President:** Brian Blau | Doug Tilley |
| **Secretary:** Jack Evans | Susanne Vaughan |
| **Treasurer:** Roland Albers | 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


**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.