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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.

June 2024

Original Photo: Lucas Pezeta

Prescott Astronomy Club Introduction to Astronomy

Wednesday, June 27th, 2024 at 6pm
Prescott Public Library - Founders Suite A/B

In the Prescott area, we are privileged to be able to see many of the night time sky objects not available to big city dwellers.

Learn how to take advantage of our dark skies at this presentation where members of the Prescott Astronomy Club will explain how to use star charts, mobile apps and other resources that tell you what is visible on a given night-- the moon, planets, double stars, and deep space objects (DSO's)--and how to find them. Members will offer tips on observing the sky with your eyes, binoculars and telescopes.

Afterwards, weather permitting, attendees are invited to go outside for a hands on experience with telescopes and binoculars. Bring your curiosity and your questions.

This program is held in partnership with the Prescott Public Library.

UPCOMING EVENTS

General Meeting of the Prescott Astronomy Club

Wednesday, July 3rd, 2024 at 6pm
Prescott Public Library - Founders Room

Speaker: Samuel "Sam" Myers, PhD
Topic: From Dinos to Dart: Protecting the Earth from Asteroids

Background: Millions of years ago dinosaurs ruled the world, but their reign was brought to a swift end when an asteroid roughly the size of Prescott hit the Earth. Even though these types of cataclysmic impacts are rare, the Earth is always being bombarded by asteroids of all sizes. Therefore, scientists and policy makers are increasingly dedicating time and money to help us understand these threats. In this talk, I will introduce the concept of planetary defense, and discuss some of the efforts currently underway to help protect the Earth from asteroids.

Bio: Samuel (Sam) Myers is a PhD. candidate at the Lunar and Planetary Laboratory at the University of Arizona where he does research as an NSF Graduate Research Fellow. His work is focused on observing and modeling Near-Earth Asteroids, with an eye towards understanding their composition and if they might be a threat to the Earth. He also has a strong interest in science policy and does work in this area to promote planetary defense and good governance practices at both the state and federal level.

General Meeting of the Prescott Astronomy Club

Wednesday, August 7th, 2024 at 6pm
Prescott Public Library – Founders Room

The August 2024 club meeting will feature member presentations. If you would like to give a presentation on something you have done in the past year with astronomy, please contact Brian Blau vp@prescottastronomyclub.org. Include information about your topic and if you are bringing presentation materials. Please limit your speaking time to 10 min so we can hear as many people as possible.

Astronomy Swap Meet
Sunday August 4th, 2024, 1p-4p.
Museum of Indigenous People, Pueblo Room

The Prescott Astronomy Club is holding an astronomy swap meet! This event is open to the public and we invite those interested in swapping, purchasing or selling astronomy-related items. Expect to find telescopes, mounts, eye pieces, books and more.

To reserve a table, you must contact Brian Blau vp@prescottastronomyclub.org prior to the event. One table per seller unless other arrangements are made. Tables are free for astronomy club members. We ask for a $10 donation from all other sellers, and a $20 donation from vendors. Setup time starts at 12pm.

For information on directions and parking see the club website: www.prescottastronomyclub.org.

Original Photo: unknown

Constant Companions: Circumpolar Constellations, Part III

By Kat Troche

In our final installment of the stars around the North Star, we look ahead to the summer months, where depending on your latitude, the items in these circumpolar constellations are nice and high. Today, we'll discuss **Cepheus**, **Draco**, and **Ursa Major**. These objects can all be spotted with a medium to large-sized telescope under dark skies.

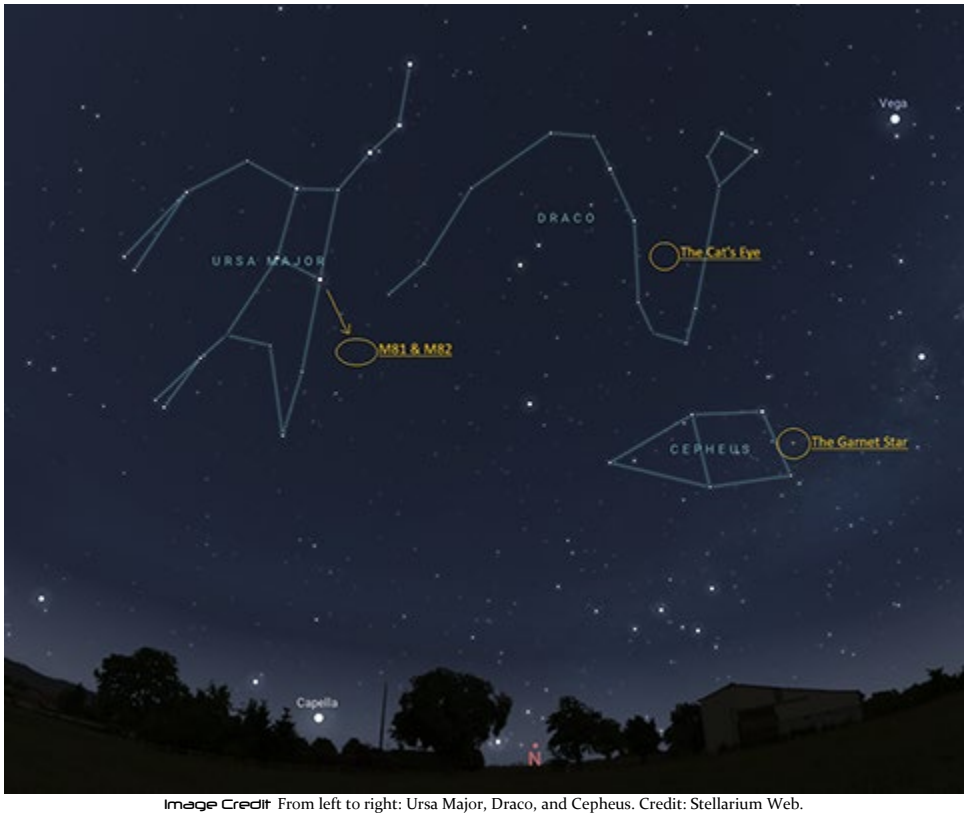

Image Credit From left to right: Ursa Major, Draco, and Cepheus. Credit: Stellarium Web.

- **Herschel's Garnet Star:** Mu Cephei is a deep-red hypergiant known as The Garnet Star, or Erakis. While the star is not part of the constellation pattern, it sits within the constellation boundary of Cepheus, and is more than 1,000 times the size of our Sun. Like its neighbor Delta Cephei, this star is variable, but is not a reliable Cepheid variable. Rather, its brightness can vary anywhere between 3.4 to 5.1 in visible magnitude, over the course of 2-12 years.

Image Credit: The Cat;s Eye Nebulae.

This composite of data from NASA's Chandra X-ray Observatory and Hubble Space Telescope gives astronomers a new look for NGC 6543, better known as the Cat's Eye nebula. This planetary nebula represents a phase of stellar evolution that our sun may well experience several billion years from now.

Image Credit: X-ray: NASA/CXC/SAO; Optical: NASA/STScI.

- **The Cat's Eye Nebula:** Labeled a planetary nebula, there are no planets to be found at the center of this object. Observations taken with NASA's Chandra X-ray Observatory and Hubble Space Telescopes give astronomers a better understanding of this complex, potential binary star, and how its core ejected enough mass to produce the rings of dust. When searching for this object, look towards the 'belly' of Draco with a medium-sized telescope.

Image Credit: The Cigar Galaxy. Credit: NASA, ESA, CXC, and JPL-Caltech

- **Bode's Galaxy and the Cigar Galaxy:** Using the arrow on the star map, look diagonal from the star Dubhe in Ursa Major. There you will find Bode's Galaxy (Messier 81) and the Cigar Galaxy (Messier 82). Sometimes referred to as Bode's Nebula, these two galaxies can be spotted with a small to medium-sized telescope. Bode's Galaxy is a classic spiral shape, similar to our own Milky Way galaxy and our

neighbor, Andromeda. The Cigar Galaxy, however, is known as a starburst galaxy type, known to have a high star formation rate and incredible shapes. This image composite from 2006 combines the power of three great observatories: the Hubble Space Telescope imaged hydrogen in orange, and visible light in yellow green; Chandra X-Ray Observatory portrayed X-ray in blue; Spitzer Space Telescope captured infrared light in red.

Up next, we celebrate the solstice 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 – April 2024

Planets on Parade

By Adam England, The Backyard Astronomer

Around 4.5 billion years ago, our solar system was nothing more than a large cloud of gas and dust, not much different than the Orion Nebula (Messier 42) that we enjoy looking at with our backyard telescopes every winter. Composed of mostly hydrogen, the cloud coalesced over millions and billions of years until a catalyst – most likely the shockwave from a nearby star exploding as a supernova — jolted the cloud into a spin and collapsing in on itself. The dense center of the nebula became our sun, the cloud flattened into a disk, and clumps of gas further out spun up into the gas giants that dominate our outer solar system. Scattered between these gas giants were pockets of primordial dust, left over from the very first stars and planets that populated our universe. This dust collided and stuck together as it began to form larger and larger rocky bodies, eventually the size of small planets called planetesimals. Dozens or possibly hundreds of these baby planets collided over hundreds of millions of years, forming the rocky planets of our solar system today, and scattering debris across the cosmos as asteroids and comets and moons.

Image Credit: Planets on Ecliptic, 3 June 2024 at 5:17 AM, SkySafari

From that initial shock that jolted our solar system into motion, everything continued to spin. Throughout eons of chaos and disorder, the rotation of the planets and moons and asteroids and comets and even the sun itself persisted. The flattened disk that was the nursery for the birth of planets maintained a consistent path through space, which today we call the ecliptic. As viewed from Earth, the ecliptic is the superhighway on which the sun and planets travel across our sky. Despite the violent early days of the solar system and the catastrophic collisions of protoplanets, none of the eight major planets ever strayed more than a few degrees from this original orbit. As such, we can look out and quickly identify the planets wandering against the backdrop of static stars. For this reason, the word planet comes from the Greek *planetes* meaning "wanderer".

Early in the morning of June 3rd these wanderers will come together for a relatively rare celestial alignment. In the hour prior to the sun rise at 5:17AM, look to the East to see up to 6 planets followed closely by the Sun. Starting to the Southeast, Saturn will shine brightly. As you move down to the East you will pass Neptune under the belly of Pisces, Mars glowing red near the crescent moon, followed by Uranus then Jupiter peeking over the horizon. Venus may be visible in the best observing situations, however Mercury will certainly be obscured by the rising Sun.

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: Zukiman Mohamad

Doug Tilley
Partial Eclipse

Image Credit: Doug Tille

David Visco

Solar Images

- Stellarvue SV115 triplet apo refractor with ScopeTronix MaxPower 1.6x amplifier (1470mm f/12.8)
- Kendrick Astro Baader film solar filter
- Canon EOS 60Da DSLR
- Images 1 to 10: single exposures, ISO 200, 1/1000 second, Canon raw CR2
- Processed and optimized in Adobe Photoshop CS6
- Images 11 to 14: Crop 640x480 video mode, ISO 200, 1/1000 second per frame at 60fps, 2-min videos (7200 frames)
- Videos processed in Autostakkert!, stacking 800 best frames for stacked image
- Registax 6 used to Wavelet sharpen stacked images
- Slight final optimization in Adobe Photoshop CS6

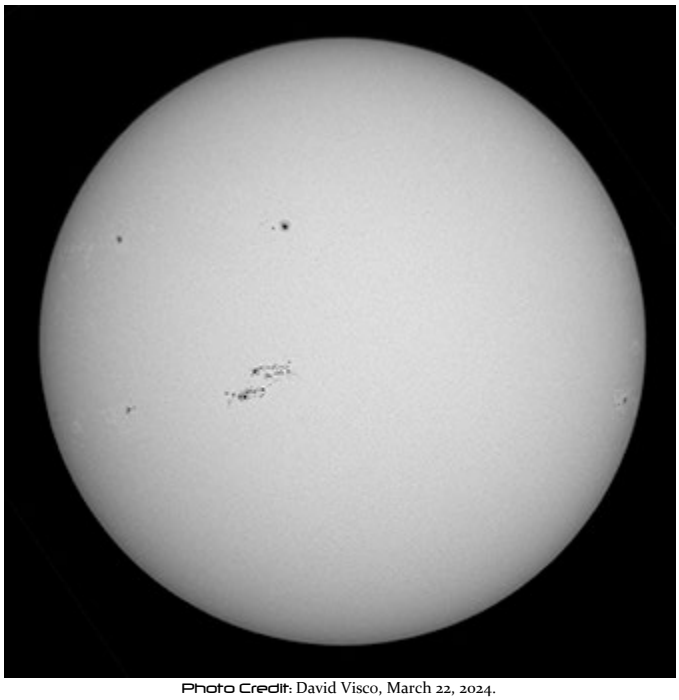

Photo Credit: David Visco, March 22, 2024.

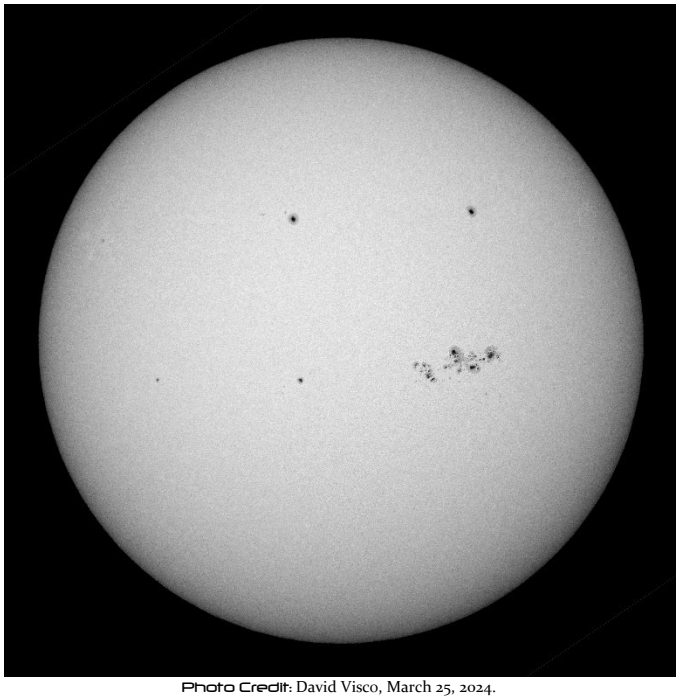

Photo Credit: David Visco, March 25, 2024.

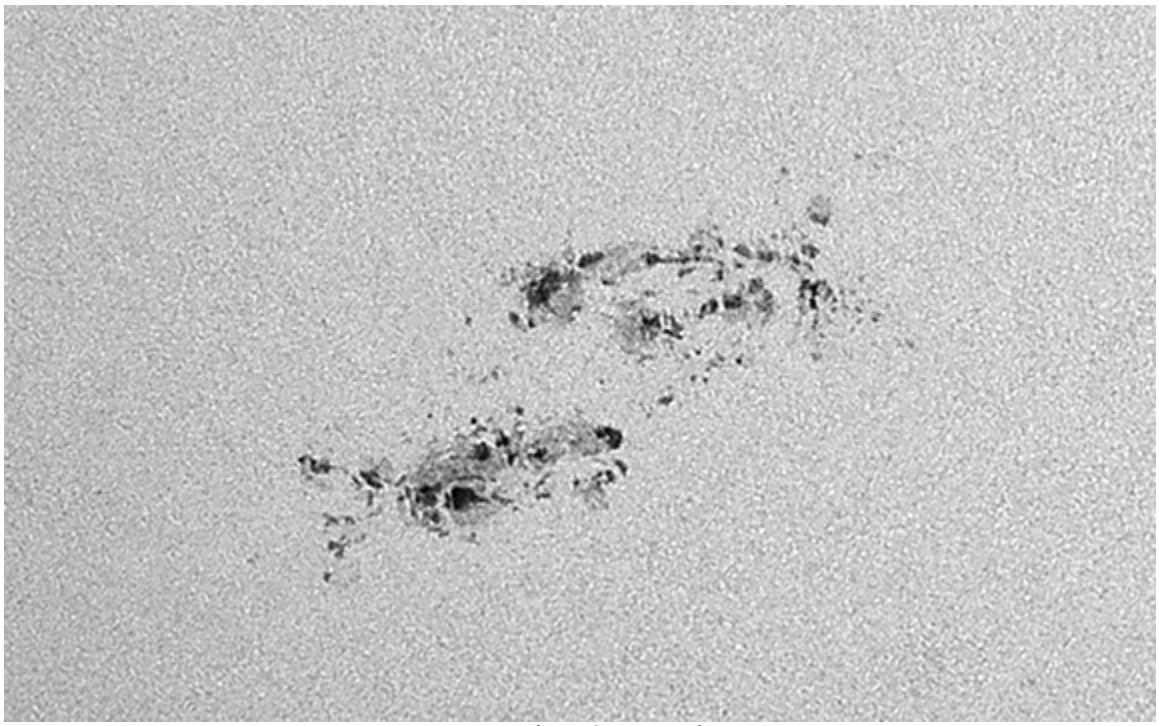

Photo Credit: David Visco, Sunspots, March 22, 2024.

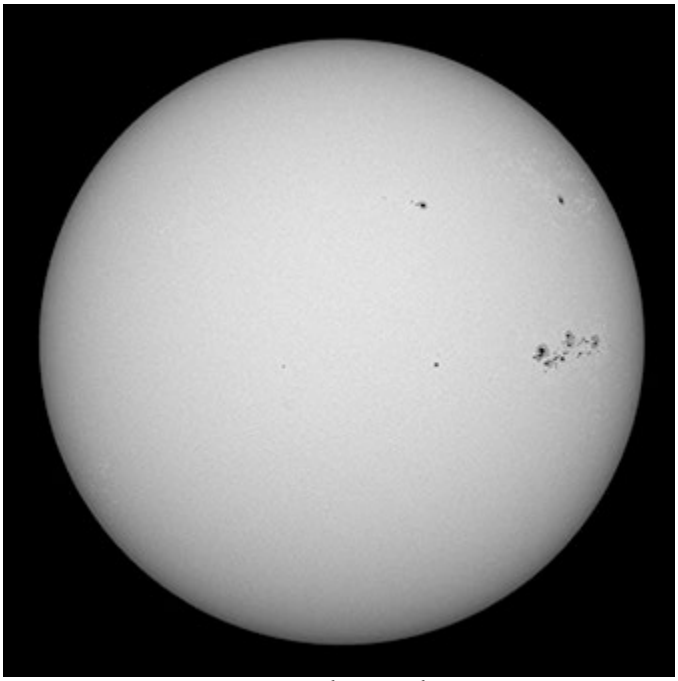

Photo Credit: David Visco, March 27, 2024.

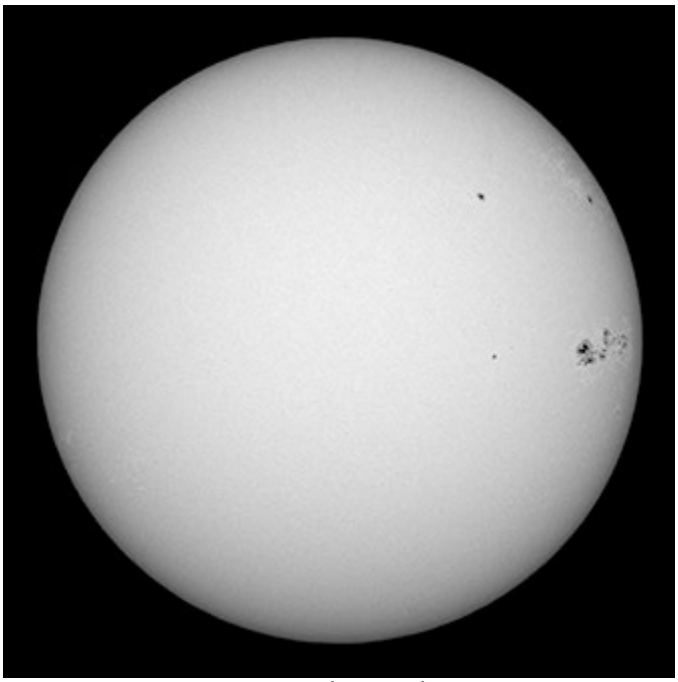

Photo Credit: David Visco, March 28, 2024.

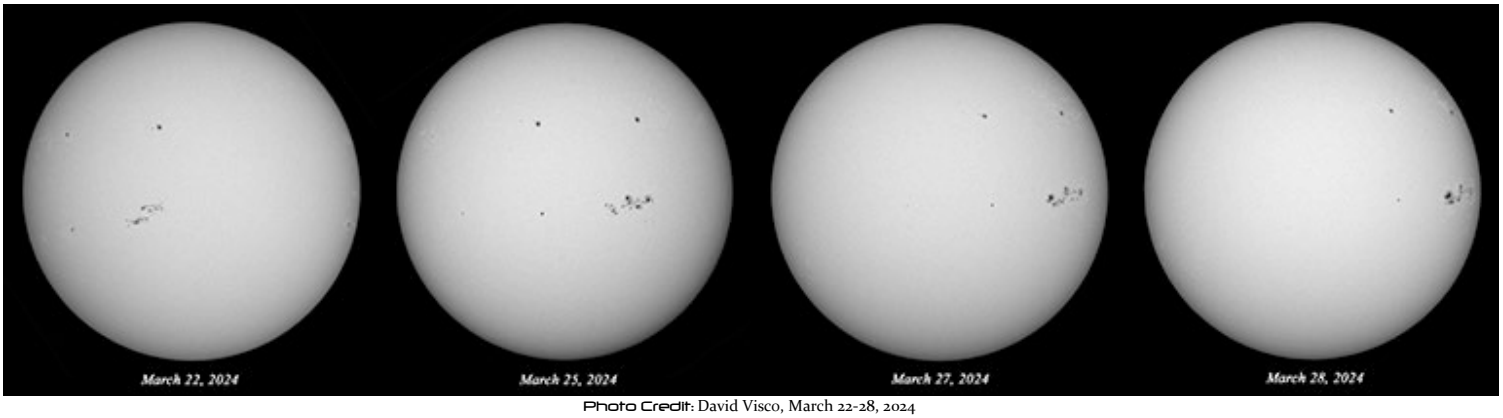

Photo Credit: David Visco, March 22-28, 2024

Photo Credit: David Visco, Sunspots, March 28, 2024.

Original Photo: Camille Cox

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

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
						1 Great Globular Cluster in Hercules is Well-Placed
2 Moon at Perigee Close Approach of Moon & Mars Conjunction of Moon & Mars Asteroid 43 Ariadne at Opposition	3 Messier 12 is Well-Placed	4 Close Approach of Jupiter & Mercury Conjunction of Jupiter & Mercury Venus at Superior Solar Conjunction	5 Moon at Perihelion Conjunction of Moon & Jupiter PAC Meeting	6 New Moon Messier 62 is Well-Placed	7	8
9	10 Daytime Arietid Meteor Shower 2024 Messier 92 is Well-Placed	11 Comet 154P/ Brewington Passes Perihelion	12	13 Mercury at Perihelion First Quarter Moon	14 Moon at Apogee Mercury at Superior Solar Conjunction	15 NGC 6388 is Well-Placed
16 Lunar Occultation of Spica Butterfly Cluster is Well-Placed NG 6397 is Well-Placed	17	18 Cluster IC 4665 is Well-Placed	19	20 Lunar Occultation of Antares June Solstice Ptolemy Cluster is Well-Placed	21 Full Strawberry Moon	22 Moon at Aphelion Lagoon Nebula is Well-Placed
23 NCG 6541 is Well-Placed	24	25	26	27 Moon at Perigee Cclose Approach of Moon & Saturn Cnonjunction of Moon & Saturn Lunar Occultation of Saturn June Bootid Meteor Shower 2024 Asteroid 42 Isis is at Opposition	28 Last Quarter Moon Close Approach of the Moon & Neptune Lunar Occultation of Neptune Cluster NGC 6633 is Well-Placed	29 X
30 Comet 13P/Olbers Passes Perihelion Messier 22 is Well-Placed						

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. 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

Original Photo: Tobias Bjørkli

PAC Board of Directors:

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

PAC Directors-at-Large:
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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

Here are job descriptions of the open positions:

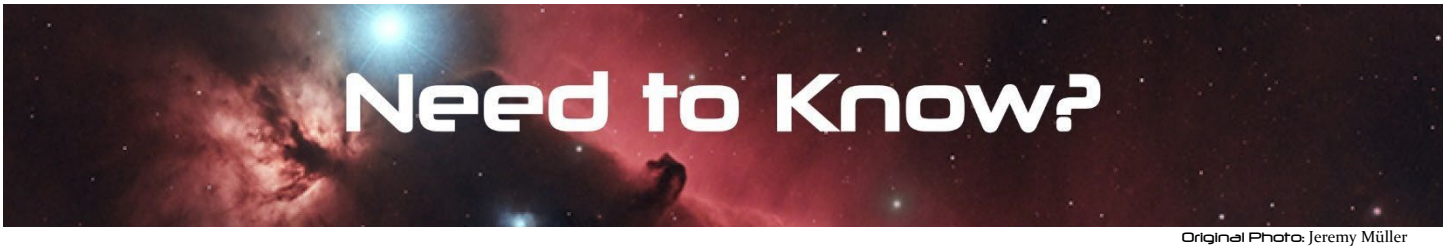
PAC Contact Information:

Website: http://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: Open
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.