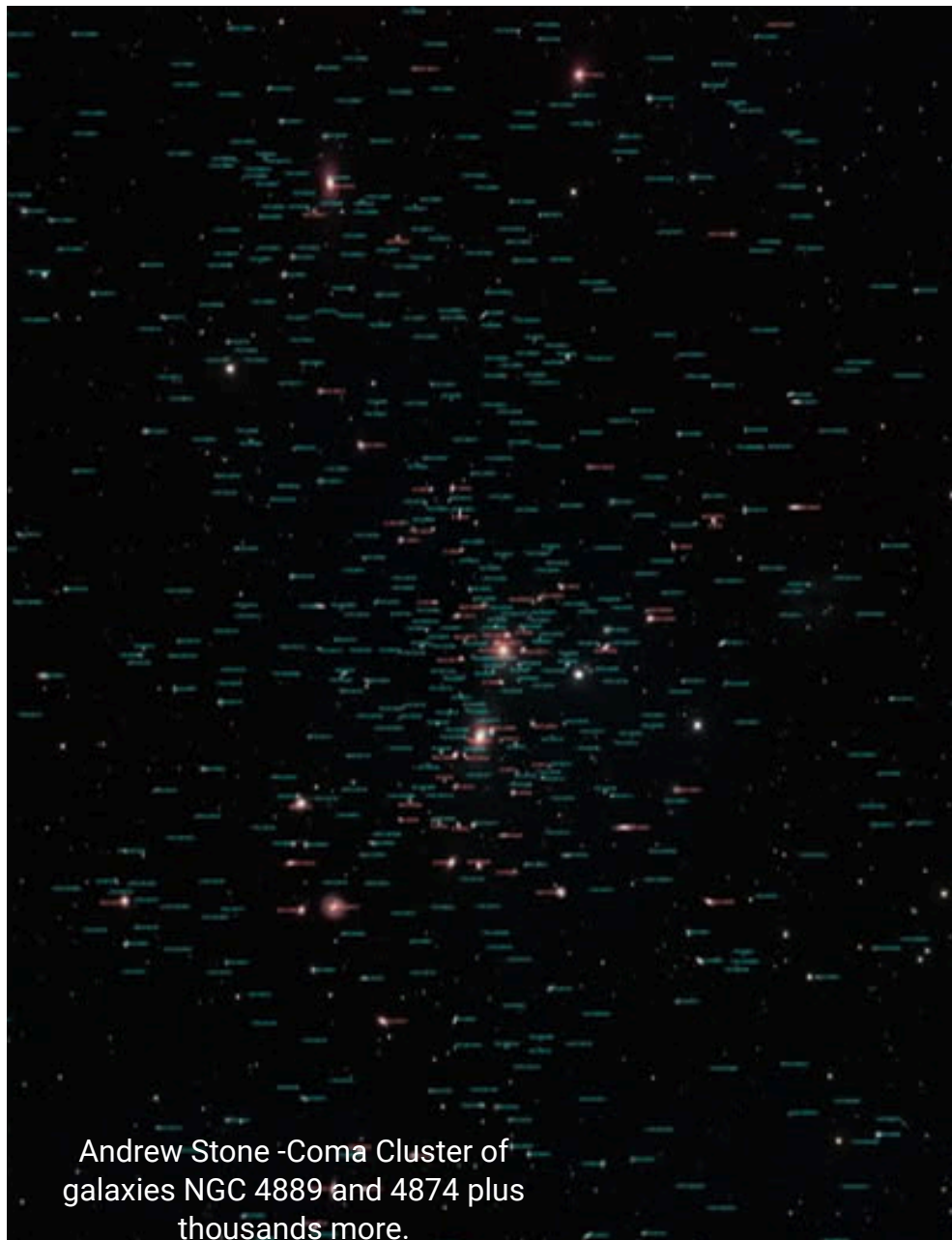




PAStimes

A Publication of the Phoenix Astronomical Society



Andrew Stone -Coma Cluster of galaxies NGC 4889 and 4874 plus thousands more.

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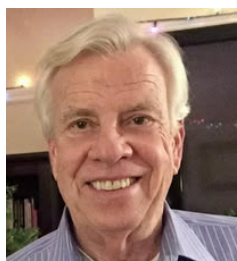
[Saturn](#)

[Celestial Showcase](#)



**EVENT
REMINDER**

| 3 – Monthly Lecture Series | 19 – Star Party | 19 – Telescope Workshop | 26- Book Club | 28 – ASIG Meeting



My friends, it looks like we still have a few storms ahead during these record-breaking heat waves. But fear not—the soothsayers say clear, dark skies are coming. No word yet on the heat!

September begins our busy nine-month PAS schedule. I hope you were able to join Vice President Mark Johnston for his spectacular presentation on our nearest star, the Sun. If not, look for the video soon at pasaz.org.

Coming soon:

1. PAS logo merchandise, including T-shirts, coffee mugs, hats, and more featuring astronomical images.
2. PAS-sponsored astronomy site visits, both in-state and possibly out of state.
3. A redesigned pasaz.org—perhaps not quite out of this solar system, but packed with light-years of information.

The Board has increased the two Sam Insana PAS Student Scholarships to \$1,500 each. Honoring longtime member and past president Sam Insana, these scholarships support two Paradise Valley Community College students majoring in astronomy or a related field. Another great reason to be proud to be a PAS member.

As we grow, we need volunteers to help at events. I hope that means you! Join our Bright Star volunteer group by contacting Ruzasabelja@pasaz.org.

September 19 is International Observe the Moon Night, and PAS is joining the celebration with a star party. Register at [International Observe the Moon Night](http://InternationalObserveTheMoonNight.org) or visit pasaz.org and select Events. Bring your telescope, snacks, drinks (water is not available on site), and a friend.

Stuart Brackney



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SEPTEMBER 2026 UPCOMING EVENTS



3

THUR

MONTHLY LECTURE SERIES

The Sun is Stranger Than You Think



19

SATURDAY

TELESCOPE WORKSHOP

101 What to Buy



19

SATURDAY

PUBLIC STAR PARTY

Join lunar observers around the world in learning about lunar science and exploration, making celestial observations Moon.



26

SATURDAY

BOOK CLUB

Einstein's Monsters: The Life and Times of Black Holes by Chris Impey



28

MON

ASIG/ASTROIMAGING

Free Software for Image Processing(SIRIL,SetiAstro) /

**MORE
INFORMATION**

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.



The Sun is Stranger Than You Think

by Mark Johnston



Speaker:
Mark Johnston



Topic:
The Sun is Stranger Than You Think

The Sun is unique in astronomy observing in that it's appearance changes every day. In this presentation Mark explains how the Sun looks in different wavelengths and many of the fantastic shapes that appear on the surface. He'll dive into what causes those structures, why they change so quickly, and some of the common misconceptions about our nearest star.

Speaker bio:



Mark Johnston, known as @azastroguy, is an internationally recognized solar astrophotographer, astronomy educator, and NASA Solar System Ambassador with more than 50 years of experience inspiring others to explore the night sky. As Vice President of the Phoenix Astronomical Society, Resident Astronomer at Four Seasons Resort Scottsdale, author of The Solar Observer's Handbook, and an award-winning outreach leader, Mark combines scientific expertise with a passion for making astronomy accessible through public programs, educational content, and breathtaking solar and deep-sky imagery.



Telescope Workshop - Operating Your Telescope

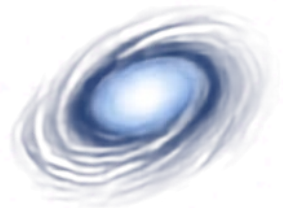
Sign up each month and schedule directly with one of our experienced teachers. This year, we're updating the way we organize workshops to offer greater flexibility for everyone. Instead of scheduling a single workshop date, we will open a monthly sign-up event on the first day of each month. Once the monthly sign-up opens, participants can choose a time and coordinate directly with one of our experienced teachers. This approach gives you more opportunities to find a session that works with your schedule while still receiving the same thoughtful, personalized guidance. Please check back at the beginning of each month to reserve your spot. We look forward to working with you!



Link to the workshop - <https://bookwhen.com/pas-eventcalendar/e/ev-sywuj-2026090119000>



Astronomy Camp on Mount Lemmon



by Liam Karr (8th grade @ Mountain Trail Middle School)

On Mount Lemmon, there is a truly magical and wonderful place. Every summer and fall, the University of Arizona invites a select group of applicants to join them on Mount Lemmon to use its amazing telescopes. I attended in both 2025 and 2026, and I would like to share some highlights of camp. The most important thing to know is that Astronomy Camp is for everyone: teen camps are held in the summer, and adult camps take place in the fall.

The first thing I would like to mention is the staff. They are all incredibly kind and helpful, and each specializes in different fields, including optics, computer science, and infrared astronomy. The camp leader, Dr. McCarthy, is especially knowledgeable.

In the Beginner Teen Astronomy Camp, we learned about topics ranging from the expanding universe and wavelengths to stellar classifications, always in a fun and engaging way. We also learned how absorption differs from emission and how these spectral lines can be used to determine what a star is made of when we observe it.

Other topics included eclipses, moon cycles, galaxy evolution, and much more. We also learned a great deal by asking questions: the counselors have a board where campers can post questions on sticky notes, which are answered whenever there is extra time.

Many intriguing questions, such as “Will you die if you were teleported into the sun for one picosecond?” were answered.

After a day of learning astronomy topics comes nighttime, and with it, the prospect of observing interesting objects. Attendees get to use—and even operate—the telescopes on Mount Lemmon. Most nights are spent rotating among four stations outside: the 32-inch and 24-inch telescopes, the 8-inch Celestron telescopes, and a stargazing station. The 24-inch telescope is usually outfitted with a camera, which allows you to take pictures of celestial objects of your choice and look at them later.

One of the most exciting parts of camp is going to Mount Bigelow during the last few nights, where you get to use the absolutely massive 61-inch Kuiper Telescope. At this scale, you can see a pretty wide range of colors, and nebulae are positively stunning—much different from the small blobs that most of us are used to seeing through personal telescopes.

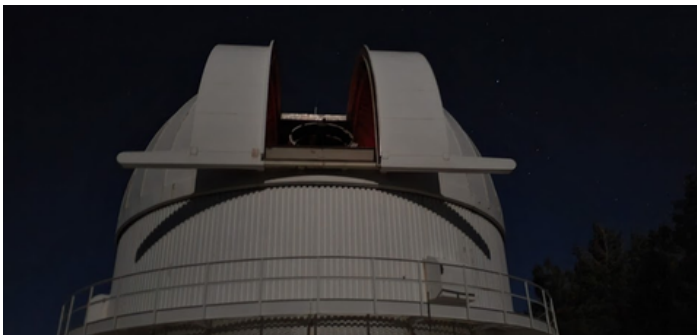
In 2025, the beginner camp also got to have a fascinating talk with Dr. Levy, a discoverer of the famous comet Shoemaker-Levy 9. (It even inspired a band to name themselves after it!) The comet burst into fragments and crashed into Jupiter. The force of this impact would have been enough to completely annihilate Earth. He told us how he got into astronomy and how we can pursue our dreams of who we want to be.

In the end, Astronomy Camp is an amazing experience for anyone interested in astronomy or wanting to learn more about it. Camp is really what got me into astronomy because it does such a good job of teaching topics in a fun and engaging way. You can come in not knowing what a nebula is and leave knowing that the Sun is a G2V-type star. It is full of wonderful experiences and people, and it's easy to make friends because you already share a common interest!

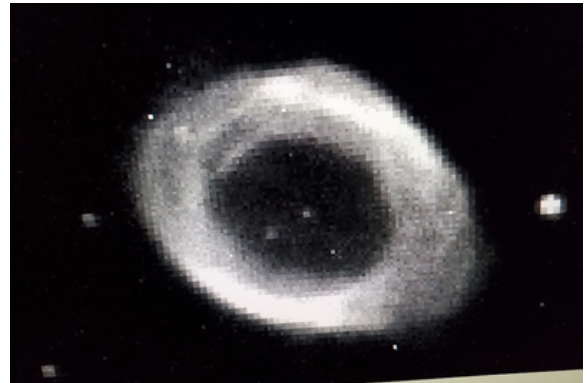
My advice for future campers is to just try it, even if you're unsure whether you'll like it. If you have any interest in science, you will enjoy Astronomy Camp. Also, bring a deck of cards and some binoculars. (I found that I ended up using both a lot!)



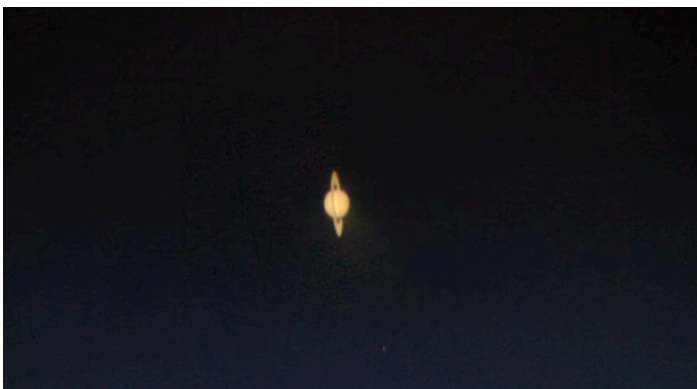
A magnet floating above a superconductor, one of the many liquid nitrogen experiments we did.



The 61" Kuiper telescope dome.



An image of the Ring Nebula taken by the camera connected to the 24" telescope.



Saturn through the 32" telescope, with the ring visible in front of the planet. (Phone camera)

For additional information click on link below for the camp

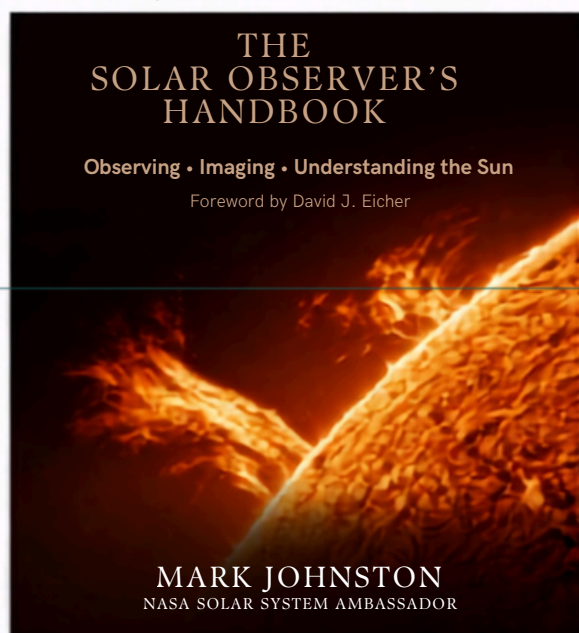
<https://astronomycamp.info>

The Solar Observer's Handbook:

Observing • Imaging • Understanding the Sun

NASA Solar System Ambassador and Phoenix Astronomical Society Vice President Mark Johnston has long championed solar astronomy through education and hands-on imaging. His AZAstroGuy outreach content — including live solar imaging demonstrations — shows how today's equipment and techniques can reveal the Sun's intricate detail with striking clarity: delicate prominences arcing above the limb, active regions bristling with magnetic complexity, and the fine granular texture of the photosphere itself.

That same spirit of accessible, practical solar astronomy drives The Solar Observer's Handbook: Observing • Imaging • Understanding the Sun. Written for anyone curious about our nearest star, the book moves readers from safe first-light viewing through progressively more advanced imaging and processing workflows — always grounded in the science behind what they're seeing.



The handbook is available on [Amazon](#), and Mark's [A Z astro Guy](#) videos offer a compelling companion resource for those who learn best by watching the techniques in action.

Together, they represent exactly the kind of modern, approachable solar astronomy that PASTimes readers are well-positioned to explore.

Reach out to Mark for more details.
markj57@gmail.com.





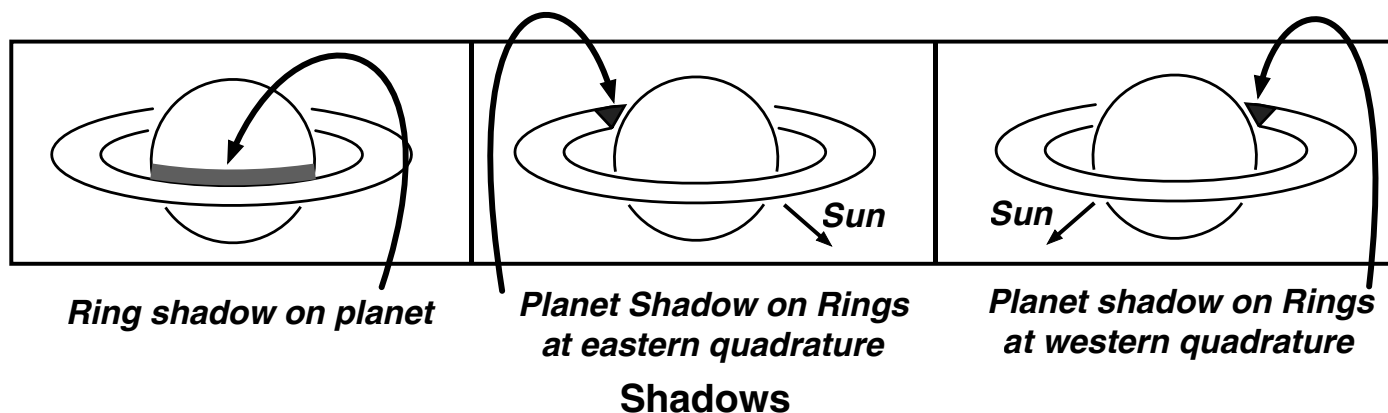
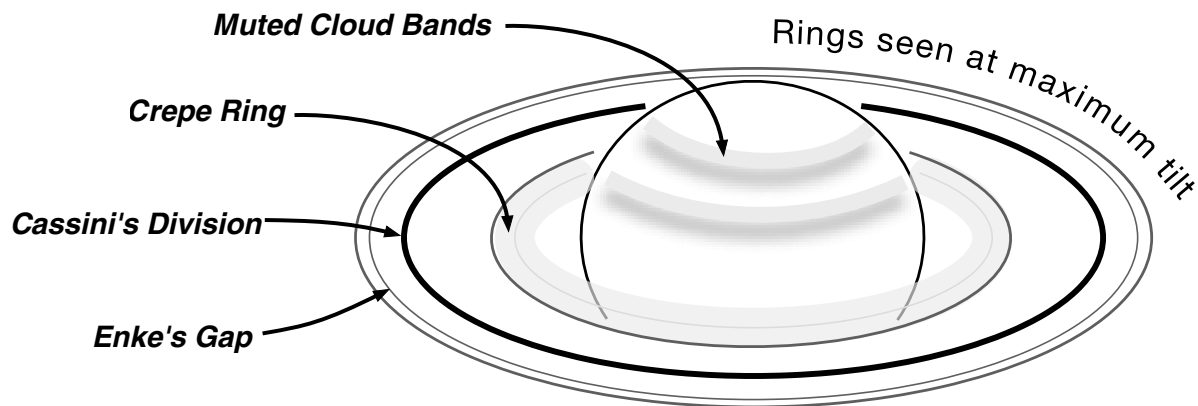
Saturn, the Ringed Planet



The "Oh! Wow!" Planet

Telescopic Aspects

As viewed through a small telescope at high magnification (>100x)
under good seeing conditions



Brighter Moons of Saturn

Saturn's 5 largest moons can be seen through a 6 inch or larger telescope. Titan is easy to spot, but the others appear as faint pinpoints hovering around the planet.

	Titan	Moon	Diameter (miles)	Maximum magnitude
		~~Titan~~	~~3190~~	<del>~8.3-9.7</del>
		Rhea	950	
		Iapetus	910	10.2-11.9
		Dione	700	10.4
		Tethys	650	10.2



Comparative sizes and distances

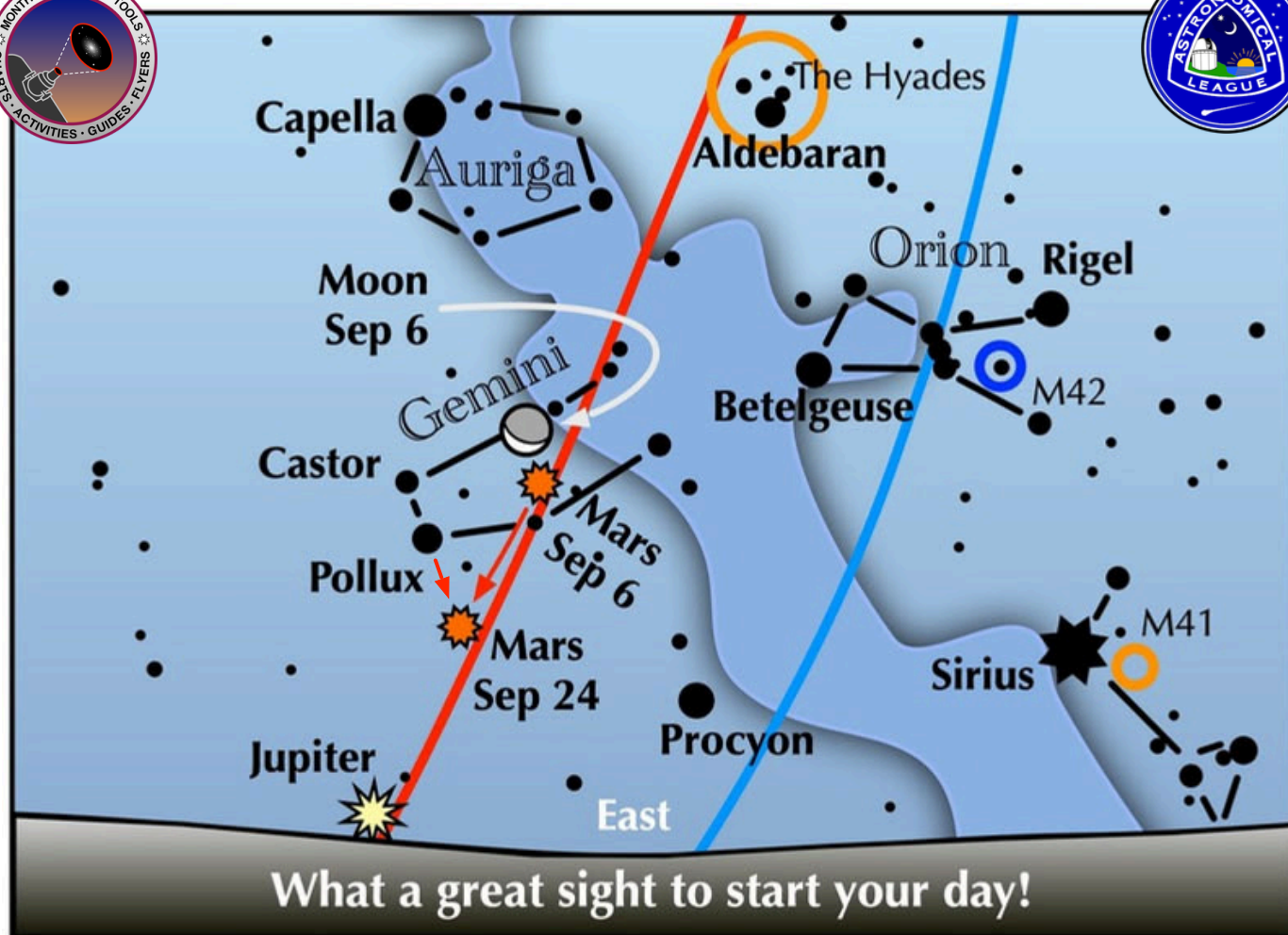
Diameter of the planet: 72,000 miles
Diameter of the ring system: 174,000 miles
Earth-Moon separation: 238,000 miles

Earth



Moon

If you can catch only one celestial event in the morning this September, see one of these two.



September 6:

Celestial Parallelogram of Castor, Pollux, Mars, and the Moon

September 24:

Mars aligns with Castor and Pollux forming the Triplets of Gemini

Look in the east 90 minutes before sunrise on Sep. 6.

- *The twinstars of Gemini—Castor and Pollux—along with Mars and the crescent moon, full with earthshine, form an attractive parallelogram.*
- *Jupiter peeks above the eastern horizon.*

Again, look in the east 90 minutes before sunrise on Sep. 24.

- *Mars aligns with Castor and Pollux, forming the Triplets of Gemini. Its brightness equals that of Pollux.*



ASIG: Lucky Imaging: Outsmarting the Atmosphere for Saturn

by Richard Meyers



Point a telescope at Saturn and the rings shimmer and swim — not from bad optics, but from seeing: pockets of air at different temperatures bending starlight unpredictably. For decades, this was the hard ceiling on how much ring and cloud detail any image could capture.

Lucky imaging broke that ceiling. Instead of one long exposure that averages in all the turbulence, images record a high-speed video — 30 to 200+ frames per second, for a minute or more. In any given second, a few frames happen to be captured during a brief full when the air settles and the image sharpens. The trick is catching those lucky moments.

Software does the rest. Programs like AutoStakker! score every frame for sharpness and keep only the best 5–20%, aligning them patch-by-patch (since turbulence distorts the rings and disk differently at any instant) and stacking them into one clean composite. A final wavelet-sharpening pass — in RegiStax, AviStack, or PixInsight — brings out fine detail like the Cassini Division, the fainter Encke gap, and subtle banding in his cloud tops, without amplifying noise.

Saturn is a tough target than Jupiter for this technique: it's dimmer, smaller in apparent size, and often sits lower in the sky, so exposures run longer and seeing has more air to distort. That makes stacking even more frames — and more careful patience — worthwhile.

This is why a modest 8-11" scope with a fast planetary camera can, on a good night, out-resolve what it ever shows visually. The payoff is real — it's the standard technique behind nearly every sharp amateur image of Saturn's rings today.

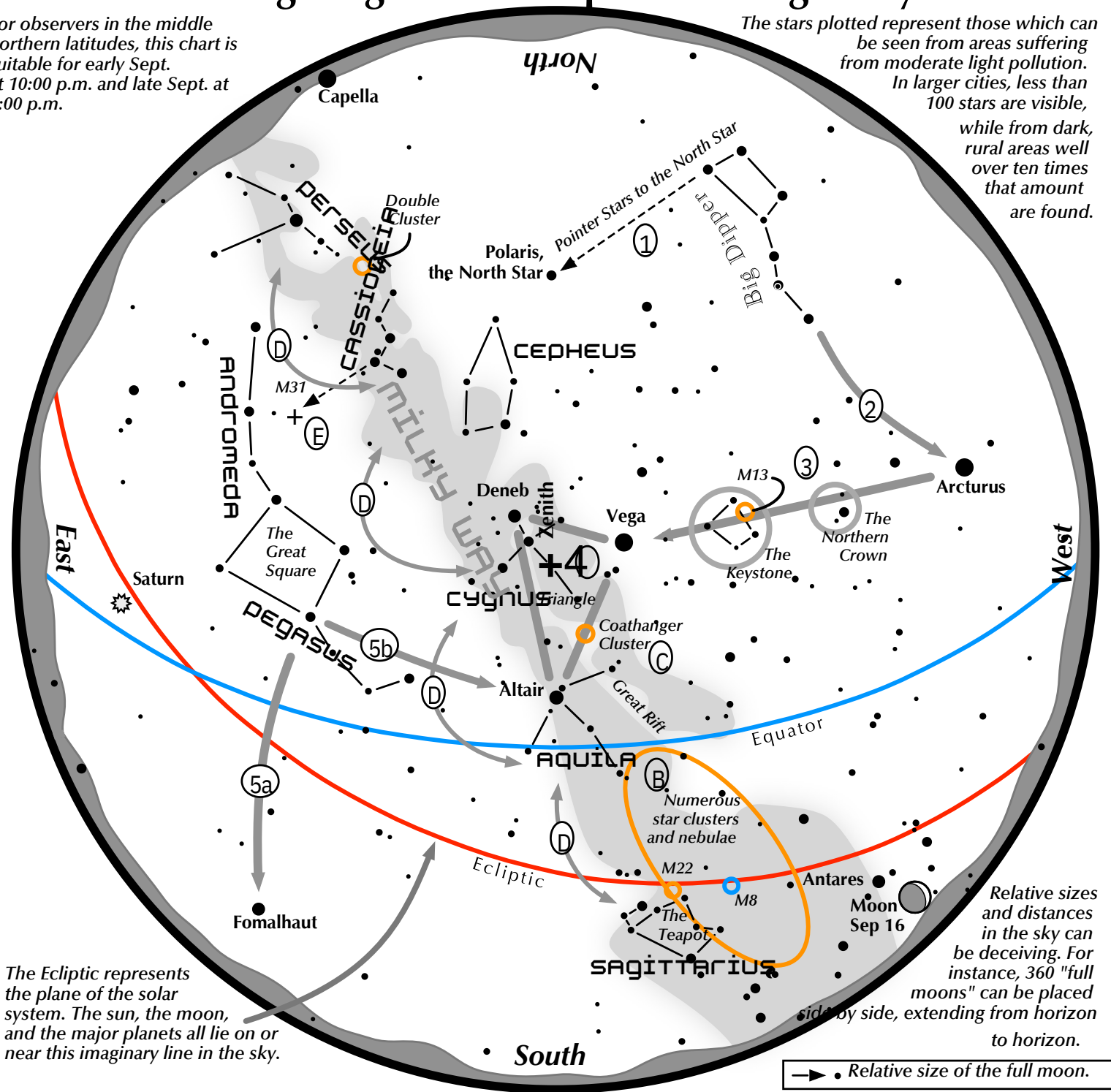


Steve Glick- Saturn, EdgeHD8, ASI120MC

Navigating the mid September Night Sky 2026

For observers in the middle northern latitudes, this chart is suitable for early Sept. at 10:00 p.m. and late Sept. at 9:00 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 mid September night sky: Simply start with what you know or with what you can easily find.

- 1 Extend a line north from the two stars at the tip of the Big Dipper's bowl. It passes by Polaris, the North Star.
- 2 Follow the arc of the Dipper's handle. It intersects Arcturus, the brightest star in the September evening sky.
- 3 Nearly overhead shines a star of similar brightness as Arcturus, Vega. Draw a line from Arcturus to Vega. It first meets "The Northern Crown," then the "Keystone of Hercules." A dark sky is needed to see these two dim stellar configurations.
- 4 The stars of the summer triangle, Vega, Altair, and Deneb, shine overhead.
- 5 The westernmost two stars of the Great Square, which lies high in the east, point south to Fomalhaut. The southernmost two stars point west to Altair.

Binocular Highlights

- A: On the western side of the Keystone glows the Great Hercules Cluster.
- B: Between the bright stars Antares and Altair, hides an area containing many star clusters and nebulae.
- C: 40% of the way between Altair and Vega, twinkles the "Coathanger," a group of stars outlining a coathanger.
- D: Sweep along the Milky Way for an astounding number of faint glows and dark bays, including the Great Rift.
- E: The three westernmost stars of Cassiopeia's "W" point south to M31, the Andromeda Galaxy, a "fuzzy" oval.



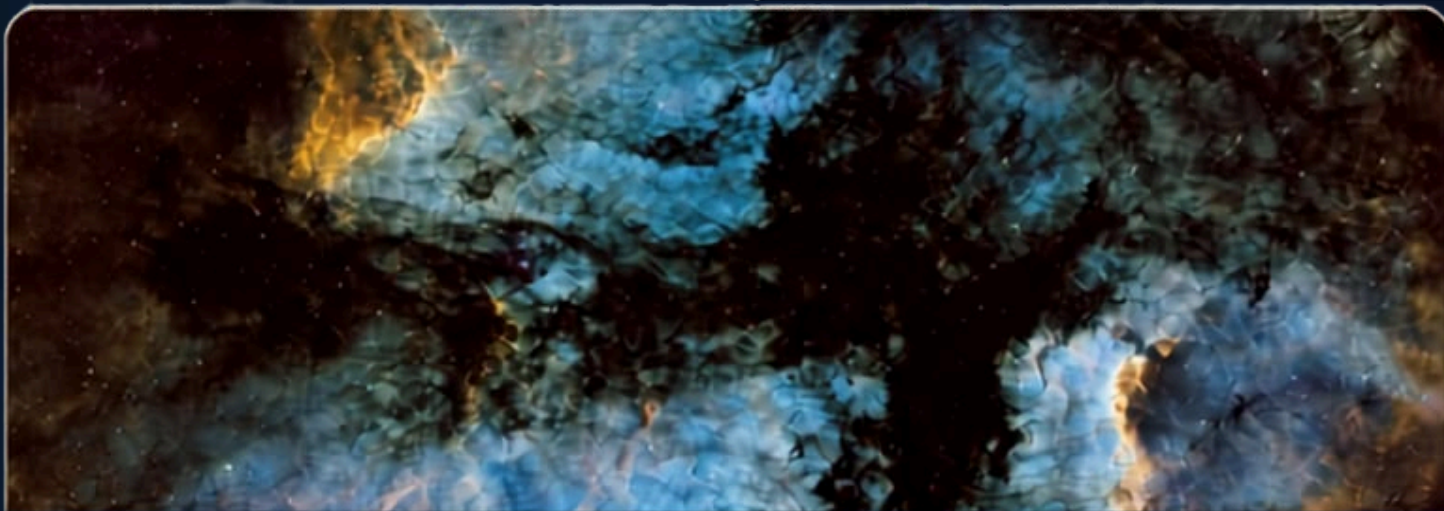
CELESTIAL SHOWCASE



STEVE GLICK - SHARK NEBULA



STEVE GLICK - TRIFID NEBULA



MARK SAVAN--NORTH AMERICA AND PELICAN NEBULAE



RICHARD SAUERBRUN-NGC7380



**ANDREW STONE-NGC 6543 THE
CATS EYE NEBULA**



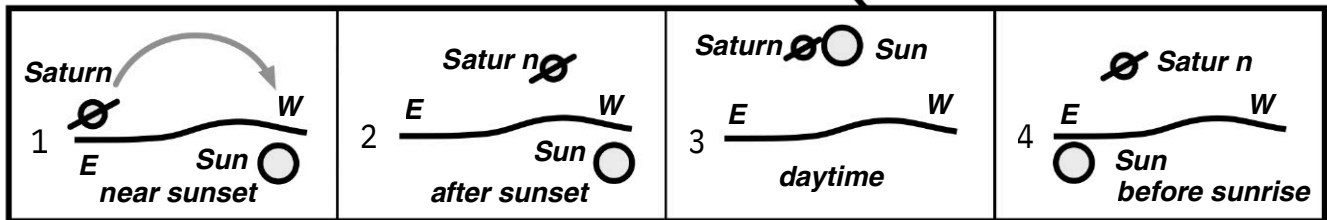
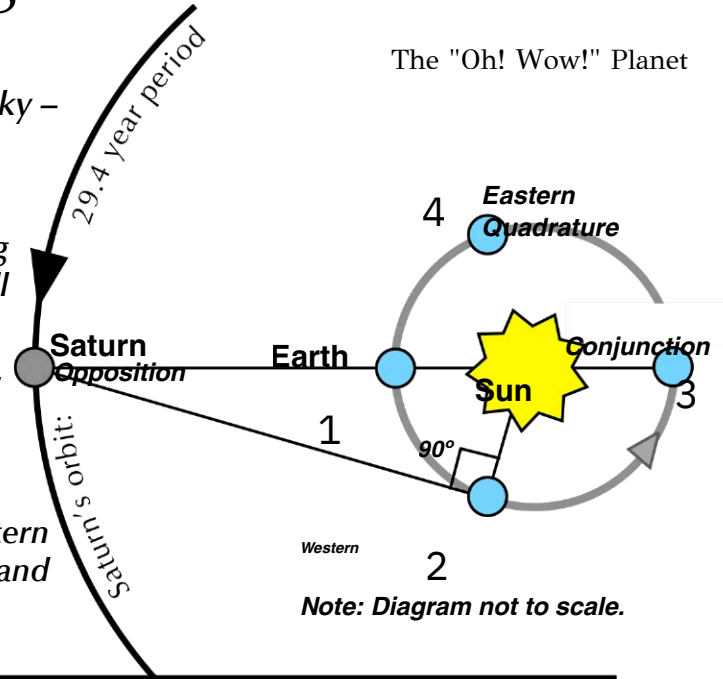
Saturn, the Ringed Planet



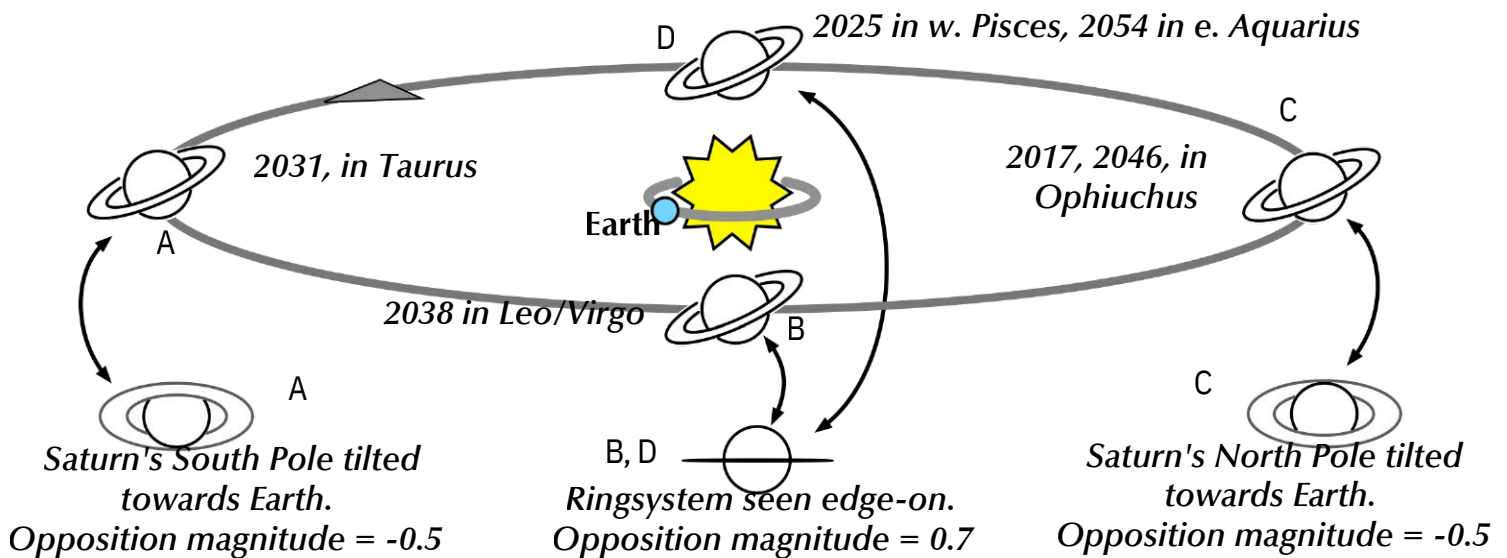
The "Oh! Wow!" Planet

Orbital Aspects

- 1 At opposition – when it is opposite the sun in the sky – Saturn is at its closest to Earth and, hence, at its brightest. It rises near sunset and is visible all night.
- 2 As Earth moves ahead of Saturn, it is seen moving nightly towards the west after sunset. Eventually, it will set just after sunset.
- 3 At solar conjunction – when Saturn lies on the far side of the Sun – it appears in the daytime sky near the Sun, and can't be seen.
- 4 As Earth catches up to Saturn, it is found in the eastern morning sky moving westward away from the Sun, and rising earlier. Eventually, it rises shortly after sunset.

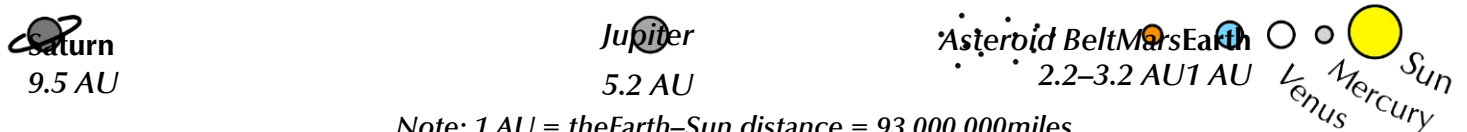


Saturn's ring tilt in its 29 year orbit around the sun



Appearance of Saturn's tilt as viewed from Earth.

Relative orbital distances from the sun to selected bodies in the solar system



Note: 1 AU = the Earth-Sun distance = 93,000,000 miles

Phoenix Astronomical Society Members Receive Exclusive DwarfLab Discount

Phoenix Astronomical Society Expands Member Loaner Inventory with Dwarf Labs Smart Telescopes

The Phoenix Astronomical Society is excited to announce a new partnership with Dwarf Labs and the addition of two innovative smart telescopes to our member loaner program!

Through the generosity of Dwarf Labs, PAS has received the following equipment:

- Dwarf 3 Smart Telescope
- Dwarf Mini Smart Telescope
- Dwarf EQ Tripod

These compact, portable smart telescopes combine imaging, tracking, and observing capabilities into an easy-to-use system controlled through a smartphone app. They are designed to help beginners and experienced astronomers alike explore the night sky, capture images of deep-sky objects, and enjoy astronomy with minimal setup.



Available Beginning July 2026

Both the Dwarf 3 and Dwarf Mini will be added to the PAS Loaner Program and will be available for checkout by PAS members

This exciting addition provides members with an opportunity to experience the latest generation of smart telescope technology before making a purchasing decision or simply to enjoy a new way of seeing the night sky.

Learn Before You Borrow. To help members get started, we encourage borrowers to review the following resources before using the equipment:



Dwarf Labs Official YouTube Channel

<https://www.youtube.com.com/@dwarflabofficial>



Helpful Setup and Training Videos

Introducing the Dwarf Mini

<https://www.youtube.com.com/watch?v=eAEZleuGFDg>



Dwarf 3 User Interface Overview

<https://www.youtube.com/watch?v=c3V0etziekY>



Setting Up the Dwarf in EQ Mode

<https://www.youtube.com/watch?v=KKZ6P60-Z8Y>

In addition, YouTube contains many excellent tutorials and user experiences. Simply search for "Dwarf Smart Telescope" to find reviews, imaging demonstrations, setup guides, and observing tips.

Clear skies,



5% Discount available here on purchases:



Telescope Loan Program



PAS Telescope Loan Program- The PAS Telescope Loan Program gives active PAS members access to a range of donated telescopes and accessories. These instruments are intended to support both visual astronomy and astrophotography learning experiences.



Overview- Members can borrow from the full PAS telescope inventory. Equipment ranges from beginner-friendly setups to higher-value imaging systems, offering opportunities to explore different observing and imaging techniques.



Check-out Requirements

- Some telescopes require completion of a short training program before use
- Higher-value equipment may require credit card information as a security measure against loss or damage
- An accessory kit (eyepieces and supporting gear) is available for all loaner telescopes when needed



Loan Period

- Standard loan duration is up to one month
- Extensions may be granted in special cases upon request



Pickup & Return

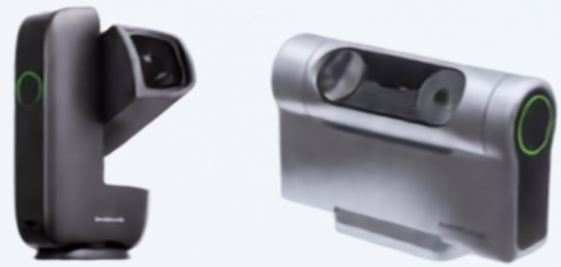
- All equipment must be collected from the PAS storage facility
- All items must be returned to the same facility by the agreed end date



How to Request a Telescope

To check out a telescope, email telescope@pasaz.org with the following information:

- Your full name
- PAS membership status
- Preferred telescope (if known)
- Intended use (visual observing or astrophotography)
- Requested loan dates



NEW- Dwarf lab Mini

NEW- Dwarf Lab 3

NEW Askar 103 APO 103mm f/6.8 Triplet Refractor Telescope, with ioptron AZ Mount Pro and an advanced eyepiece kit

2 x ZWO SeeStar S50

Coronado Personal Solar Telescope (PST)

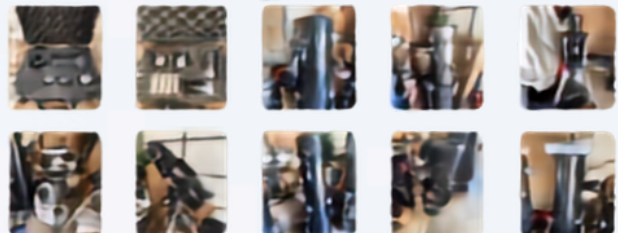
Orion SkyQuest XT-10 - 10' Dobsonian

Orion Skyquest XT-8 - 8' Dobsonian

Sky-Watcher – 10" Collapsible Motorized Dobsonian

Accessory Kit #4 - Advanced Observing

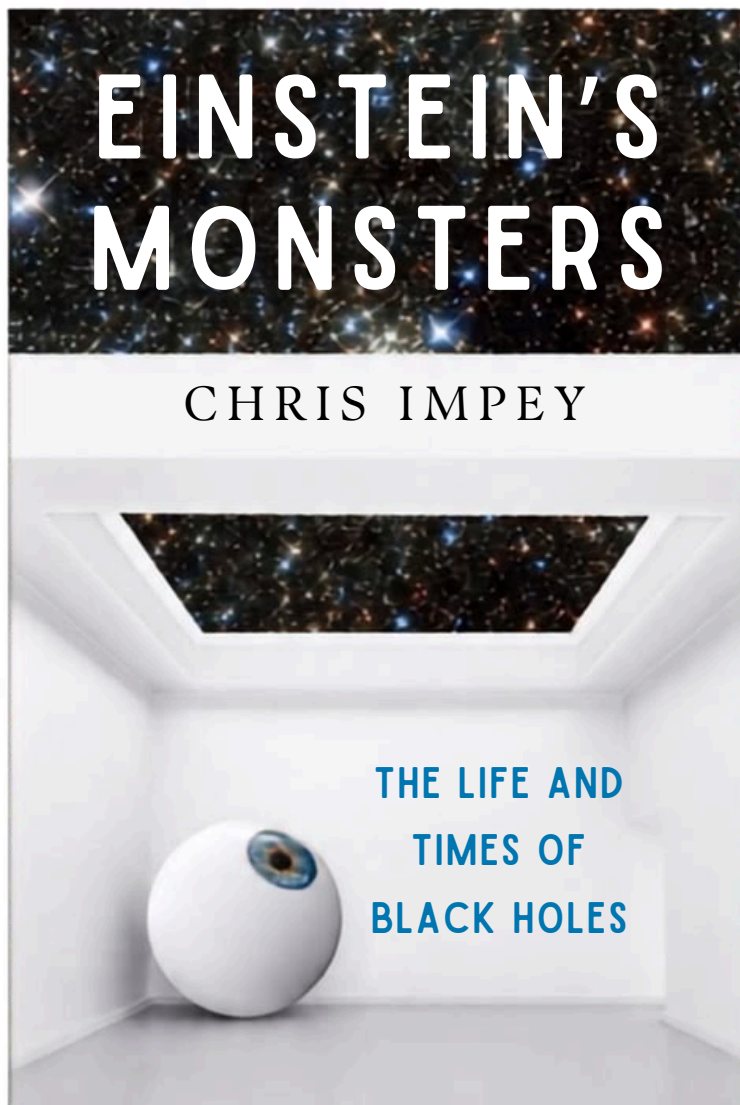
Accessory Kit #5 – 1.25" Eyepieces & filters





The 2026 Book Club

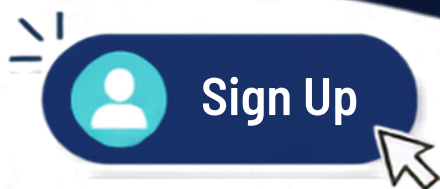
For more information or to join, contact Cyrus at
saeidmousavi@yahoo.com



Chris Impey explains how black holes were predicted, discovered, and studied. He covers their formation, their role at the centers of galaxies, and what they reveal about gravity, space, time, and the universe.

JOIN OUR SOCIETY

EXPLORE. CONNECT. INSPIRE...



Are you fascinated by the stars and eager to explore the wonders of the universe? Do you want to connect with like-minded individuals who share your passion for astronomy?

Hi everyone! Great news. Renewing your membership is quick and easy: just visit www.pasaz.org, look in the left index column for "Join Our Society," click it, and you're on your way.



We now offer a year-round membership, which means you can join at **any time with no enrollment deadlines**, and you'll receive a full 12 months of benefits. If you have any questions, our Membership Manager is happy to help at membership@pasaz.org.



Benefits of PAS Membership

- ✓ Helping the Society accomplish its mission of astronomy outreach and education
- ✓ Contributing toward the Society's ability to provide college scholarships to astronomy students
- ✓ Participation on the Society's email distribution list
- ✓ Email receipt of the Society's monthly newsletter
- ✓ Participation in the Society's telescope loaner program
- ✓ Ability to serve as a teacher at the Society's telescope workshops
- ✓ Ability to serve as a mentor at the Society's star parties
- ✓ Ability to participate in the Astro Imaging Special Interest Group (ASIG)
- ✓ Ability to serve as a paid presenter in the Society's Star Tours program
- ✓ Opportunity to purchase used astronomical equipment at 50% off current value
- ✓ Access to club trips to the darkest Arizona sites and top observatories
- ✓ Connections with professional astronomers and researchers through guest lectures or workshops.
- ✓ Opportunities to hold leadership positions within the club, such as committee chairs or officers.



By becoming a member of the Phoenix Astronomical Society, you not only enhance your own astronomical journey but also contribute to a vibrant community that shares your passion. Together, let's explore the universe and inspire others to do the same.

Sign Up Now and Start Exploring the Cosmos with Us!



Phoenix Astronomical Society Contact Info



President Stu Brackney — president@pasaz.org



Vice President Mark Johnston — vicepresident@pasaz.org.



Treasurer Richard Sauerbrun — treasurer@pasaz.org



Secretary Chris Ford — secretary@pasaz.org



Newsletter Editor Richard Meyers — editor@pasaz.org



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- Andrew Stone — Member-at-Large (mal2@pasaz.org)
- Damon Finell — Membership Manager (membership@pasaz.org)



Programs & Events

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- Ruza Sabelja — Event Manager (events@pasaz.org)



Website & Communications

- Ed Skinner — webmaster@pasaz.org

PAS is incorporated in the state of Arizona as a non-profit, scientific and educational 501(c)3 organization. Our newsletter PASTimes is published monthly and distributed via the Internet. All issues are available for download on our website **www.pasaz.org**. Ads for astronomy equipment are provided as a courtesy to sellers and buyers, and do not constitute any endorsement by PAS. All photos by Richard Meyers unless otherwise credited. All articles and photos are copyright by their respective authors or PAS times.

Mark Johnston
Ted Blank
Markavan
Andrew Stone Star Tours
Manager
Richard Sauerbrun
Stu Brackney
Roger Anzini
Peter Turner
Chris Ford
Ryder David
Alessandro Cavallaro
Richard Meyers
Damon Finell
Luke Douglas

Star Tours Team 2026

These individuals have successfully met the qualifications to participate in Star Tours Events and receive compensation \$\$ for their services. 🌟

