

Monthly Newsletter



PAStimes

A Publication of the Phoenix Astronomical Society



Andrew Stone—M86 8.5 hrs of data

In this newsletter
you can expect:

Message From
the President

The Eclipse that
Changed
Physics

FWHM (Full
Width Half
Maximum)

See One Event

Navigating the
Night Sky

How Do You Find
Celestial
Objects?



18– Telescope Workshop | 21 – Monthly Lecture Series
| 23 – Book Club | 23–Public Star Party | 25 – ASIG Meeting

Stu's Views



PAS Historian: I'm still looking for a volunteer or two to help with the wonderful history of this organization. Interested? Contact me: stuartbrackney@pasaz.org

Annual PAS election of officers: Great news. You have done it again! Yep, we have successfully completed the election of officers for the upcoming 2026-27 PAS Year. Check your email for results. Plus, you can meet these new officers at our May gathering on the campus of PVCC, May 21st at 7:00 p.m., Building Q 120 A.

Redundancy: Sometimes this word is used to describe backup plans or systems. PAS needs backup people for our leadership team, should they become unavailable. To continue meeting the needs of YOU...our members, we are asking some of you to contact me on how you can become a "backup." This is extremely critical for some of our leadership team positions. Interested: stuartbrackney@pasaz.org

Telescope workshops: Popular with new telescope owners and those who want to purchase a scope. Open to the public.

May 18 6:00 p.m., to register [Operating your telescope](#)

May 18th 7:00 p.m., to register [What to buy](#)

PAStimes: your newsletter is crafted by our Editor, Richard Meyers, Richardmeyers@pasaz.org but is written by many of you, our members. Yes, you can send your images, stories, and astronomy-related information to him so he can share it with everyone. Have a scope you want to sell...advertise in the PAStimes.

Bright Star: That's the name of a group of PAS volunteers who help out at our various events. If you have been to any of our events, you can understand why we need and appreciate these Bright Star volunteers. Want to be one? Contact ruzasabelja@pasaz.org

Tip of the day: When you move your scope outside of your house, let it acclimate to the outdoor temperature for thirty to forty minutes before using. It helps improve your viewing.

Stuart Brackney



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MAY 2026 UPCOMING EVENTS



21

THUR

MONTHLY LECTURE SERIES

Monthly Lecture Series and PAS Awards Ceremony



18

MONDAY

TELESCOPE WORKSHOP

101/201

101 What to buy
201 How to operate your telescope\$.



23

SATURDAY

BOOK CLUB

Sean Carroll's Something Deeply Hidden: Quantum Worlds and the Emergence of Spacetime (2019)



23

SATURDAY

PUBLIC STAR PARTY

Our Star Parties are held at one of our public star party sites which have an excellent view of the night sky. Parties begin before sunset so equipment setup may be completed in the daylight.



25

MON

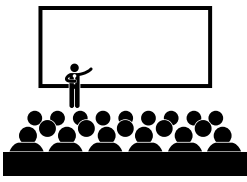
ASIG/ASTROIMAGING -

MEMBERS ONLY

Are you passionate about capturing the beauty of the cosmos? Whether you're a beginner or an experienced astrophotographer, now is the perfect time to join

**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.



May Lecture:

Speaker: PAS Memembrs

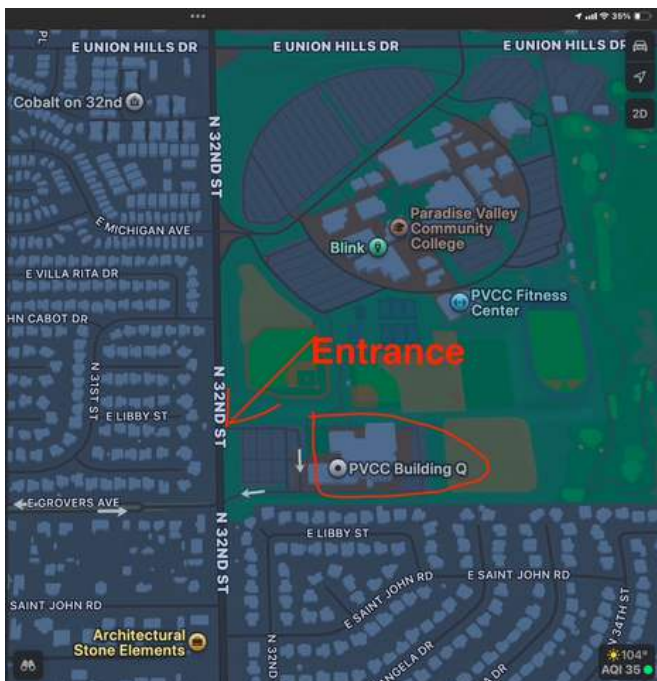
In addition to our monthly lecture, we will be holding the PAS annual awards ceremony, where we honor the PAS members who have helped achieve PAS's outreach goals by working private Star Tours events, giving lectures, teaching Telescope Workshops and facilitating our many star parties.

Topic: NEAF, NEAIC shows and more.

ATTENTION

NEW LOCATION

All of our PAS events at Paradise Valley Community College are now being held in **Building Q room 120A**. This is the former Maricopa County Library building south of the PVCC athletic fields on 32nd street.



Mars Exploration Update 2026 month's meeting

by Richard Meyers

Mars exploration has entered a decisive era. Discoveries from active rover missions confirm that Mars once supported long-lasting liquid water, complex geology, and potentially habitable environments. Current findings are shaping priorities for sample return and future international missions aimed at answering whether life ever existed on the Red Planet.

Ancient Water and Habitability: Geologic evidence shows Mars sustained liquid surface water roughly three billion years ago. Preserved sedimentary structures, including fossilized ripples, provide direct proof of flowing surface water. Mineral formations created by evaporating groundwater record long-term subsurface activity, confirming that water was stable and widespread for extended periods.

Curiosity Rover – Gale Crater: Curiosity continues exploring the lower slopes of Mount Sharp in Gale Crater. As of April 2026, the rover has traveled 36.6 kilometers and climbed more than 850 meters in elevation. Current investigations focus on exiting the Boxwork Structure unit, a region formed by mineral deposition from groundwater. Key discoveries include mineral nodules linked to ancient aqueous activity, the identification of pure elemental sulfur, and observations of noctilucent clouds that offer insight into Mars' present-day atmosphere.

Perseverance Rover – Jezero Crater: Perseverance is exploring Jezero Crater, an ancient lake basin with a preserved river delta. The rover has now traveled 41.5 kilometers, surpassing Curiosity's total traverse. Notable results include identification of a potential biosignature within an ancient river deposit, with no compelling non-biological explanation identified to date.



Ingenuity Helicopter: The Ingenuity helicopter completed 72 powered flights on Mars before concluding flight operations in January 2024. The mission exceeded all expectations and demonstrated that powered flight is possible on other planets. Ingenuity continues to provide valuable engineering and environmental data from the Martian surface.

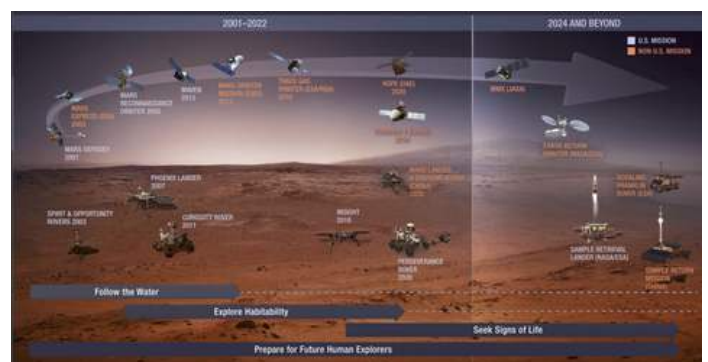
Sample Return and Infrastructure: Returning Martian samples to Earth remains a top scientific priority, as nearly all advanced laboratory analysis capabilities are Earth-based. At the same time, aging Mars orbiters highlight the need for replacement data-relay spacecraft to support current and future surface missions.

What's Next

Upcoming missions reflect strong international commitment to Mars exploration. Europe's Rosalind Franklin rover is planned for launch in 2028 to search for signs of life in clay-rich terrain. Japan's MMX mission will return samples from Phobos, launching in 2026. Additional flybys, new orbiters, and a newly announced nuclear-powered Mars mission planned for 2028 will further expand scientific capabilities.

Bottom Line

Mars is no longer a question of whether it once had habitable conditions. Clear evidence of water, complex environments, and promising biosignatures suggests the planet may have supported life in the distant past. The coming decade, particularly through sample return, will be critical in answering one of science's most profound questions.



Summary of Outreach Events



Star Tours & Outreach events April:

- 21st Hyatt House
- Scottsdale Old Town Event
- 22nd MacDonalds Ranch





StarTours by Andrew Stone

Objects to View in May 2026						
Object Name	Object Type	Constellation	Visual Magnitude	Apparent Size	Rise Time	Set Time
Jupiter	Planet	Gemini	-2.7	45"	9:00 AM	11:30 PM
Venus	Planet	Taurus	-3.9	11.3"	5:30 AM	8:00 PM
NGC 2392 Eskimo Nebula	Planetary Nebula	Gemini	9.2	0.8'	9:30 AM	11:30 PM
NGC 3242 Ghost of Jupiter	Planetary Nebula	Hydra	7.3	25"	2:00 PM	12:30 AM
NGC 6543 Cat's Eye Nebula	Planetary Nebula	Draco	8.1	0.4' x 0.3'	Circumpolar	Circumpolar
NGC 6826 Blinking	Planetary Nebula	Cygnus	8.8	2.1'	7:00 PM	2:30 AM
M57 (Ring Nebula)	Planetary Nebula	Lyra	8.8	1.5' x 1'	10:30 PM	9:30 AM
M104 Sombrero	Galaxy	Virgo	8	9' x 4'	5:15 PM	4:30 AM
M51 Whirlpool	Galaxy	Canes Venatici	8.4	11' x 7'	4:30 PM	7:00 AM
M65, M66, NGC 3628 Leo Triplet	Galaxies	Leo	9.3, 8.9, 10.2	9' x 2' & 9' x 4'	1:30 PM	3:00 AM
M81 & M82 Bode's Galaxy	Galaxies	Ursa Major	6.9 & 8.4	21' x 10' & 11' x 4'	Circumpolar	Circumpolar
M86 Markarian's Chain	Galaxies	Virgo	8.8	11.5' x 8.4'	2:45 PM	4:00 AM
M3	Globular Cluster	Canes Venatici	6.1	18'	4:30 PM	5:30 AM
M5	Globular Cluster	Serpens	5.6	23'	7:30 PM	7:30 AM
M10	Globular Cluster	Ophiuchus	6.4	20'	8:30 PM	7:30 AM
M13 Hercules	Globular Cluster	Hercules	5.8	20'	8:30 PM	10:00 AM
M92	Globular Cluster	Hercules	6.3	14'	8:30 PM	7:30 AM
M44 Beehive Cluster	Open Cluster	Cancer	3.1	95'	11:30 AM	1:30 AM
Castor	Double Star	Gemini	1.6	5"	9:00 AM	12:00 AM
Albireo	Double Star	Cygnus	3.1 & 5.1	35"	10:15 PM	11:00 AM
Double Double Epsilon Lyrae	Double Star	Lyra	5 & 6	3.5"	7:15 PM	12:00 PM

**HELP
NEEDED**

Science Judges needed for International Science Fair – Phoenix Wed May 13

Regeneron ISEF 2026 - Phoenix, Arizona: The world's largest STEM conference is in Phoenix this year. The Regeneron International Science and Engineering Fair (ISEF) will be at the Phoenix Convention Center, May 9-15, 2026. The Regeneron International Science and Engineering Fair (Regeneron ISEF) is the world's largest and most prestigious STEM competition for high-school students (5000 students from over 50 countries are expected), bringing together top young researchers from around the globe to present original scientific and engineering projects. More than 1000 judges are needed to determine the winners of the 2026 Regeneron ISEF. The main day judges are needed is Wed May 13. The prize-award day is Thurs May 14. More than 500 general volunteers are needed across a spectrum of activities. Learn more about serving as a Grand Award judge or general volunteer: <https://www.societyforscience.org/isef/>

THE ECLIPSE THAT CHANGED PHYSICS

by Richard Meyers

One hundred and six years ago this month, a total solar eclipse gave two teams of astronomers their chance to settle one of the biggest questions in physics —and the universe cooperated, at least partially.

If you've ever stood under a darkening sky during totality — watching stars appear where moments before there was only blue — you already understand something of what Arthur Eddington's teams were chasing on May 29, 1919. They weren't just photographing the corona. They were looking for proof that space itself bends.

For more than 200 years, Isaac Newton's framework for gravity was the foundation of astronomy. Planets moved because massive objects exerted force on one another — and the math worked extraordinarily well. It still does, for most of what we do at the eyepiece. Under Newton, gravity acted across space. Under Einstein, gravity reshaped space itself.

In 1915, Albert Einstein introduced a bold new idea: gravity isn't a force pulling objects together. Instead, massive objects like the Sun bend space and time, and everything else moves along those curves. The Earth orbits the Sun not because it's being pulled, but because it's following a path shaped by the Sun's influence. It was an elegant concept—but without evidence, it remained just a theory, and proving it would be a serious challenge.

THE MEASUREMENT THAT MATTERED-1919 ECLIPSE — AT A GLANCE

Maximum totality: 6 minutes+ along the eclipse path

Expedition locations: Príncipe Island (West Africa) & Sobral, Brazil

Einstein's prediction: 1.75 arcseconds of deflection

Newtonian-style estimate: 0.87 arcseconds — exactly half

Results announced: November 1919, Royal Society, London

Both theories agreed on something surprising: starlight passing close to the Sun should bend. Where they disagreed was how much. Einstein's prediction was exactly double the Newtonian figure. The difference was less than one arcsecond — a hair-thin angle — but large enough to show up on a photographic plate with careful technique and a cooperative sky.

The geometry only works during totality. You need the Moon to block the Sun completely before stars near the solar limb become visible. And you need to compare those positions against reference frames taken months earlier, with the Sun well out of the frame, to measure any shift. It's the same fundamental challenge we face doing precise astrometry today — except they were doing it on glass plates, in remote locations, with one shot at the data

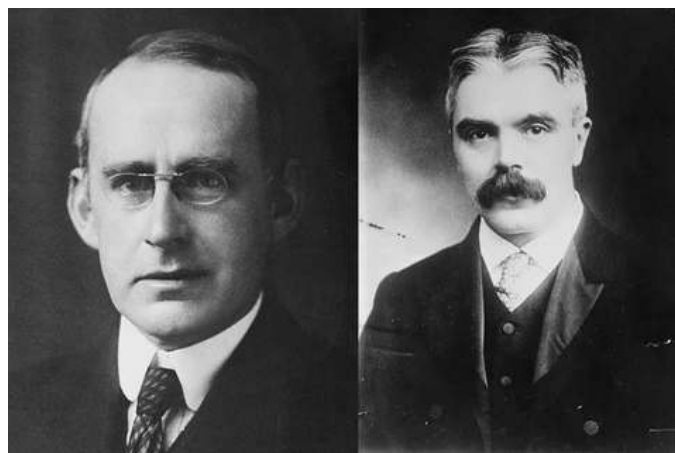
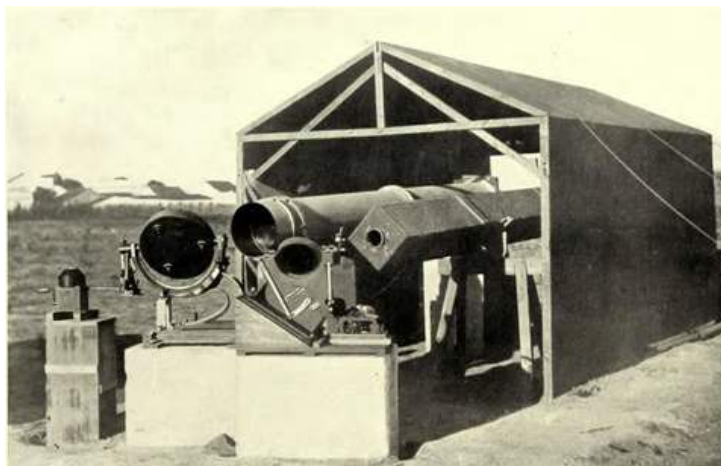


FIGURE 1 — Arthur Eddington (left) and Frank Dyson (right). Public Domain



**FIGURE 2 — By C. Davidson - File:Eddington A. Space Time and Gravitation. 1920.djvu, Public Domain,
<https://commons.wikimedia.org/w/index.php?curid=38550909>**

TWO SITES, ONE CHANCE

British astronomer Arthur Eddington (**Figure 1**) sent one team to Príncipe Island off the west coast of Africa, and another to Sobral in northern Brazil. Two independent data sets from different locations — good scientific instinct, and it turned out to matter. Príncipe had clouds. The team there salvaged only a handful of usable images, with large uncertainties baked in from the start. Sobral had much cleaner skies and produced the stronger data. (**Figure 2**)

After months of painstaking measurement, the results were announced in November 1919. The observed deflection was consistent with Einstein's prediction — and significantly larger than the Newtonian-style estimate. It wasn't a perfect result, and the story of how the data was handled is more complicated than the headlines suggested.

The world woke up to headlines it had never expected to read.

The Times (London): "Revolution in Science — New Theory of the Universe — Newtonian Ideas Overthrown."

The New York Times: "Lights All Askew in the Heavens"

Those headlines ran the morning after the November announcement and circled the globe within days. Einstein (Figure 3) — barely known outside physics circles — became a household name almost overnight. What made that moment even more striking was the context: this was 1919, one year after the end of World War I. British scientists had organized an expedition specifically to test the theory of a German physicist (Einstein). Science, at least in this instance, crossed a divide that politics had made almost impassable.

WORTH KNOWING — THE DATA CONTROVERSY

Worth being straight about: the 1919 data was messier than the headlines let on. The Príncipe team lost most of their usable images to clouds — not exactly the clean result the Royal Society announced. Sobral was better, but the precision still wasn't airtight, and some data sets were quietly set aside during analysis, a decision historians have been picking apart ever since. None of that changes the bottom line. Modern measurements confirm Einstein's prediction to high precision. The 1919 teams got the right answer — they just got there on shakier ground than anyone was willing to admit at the time.

WHAT IT UNLOCKED

The eclipse didn't hand physics a final answer — but it handed it a new direction. Follow those same equations forward and you get black holes, gravitational lensing, the discovery that entire galaxy clusters can bend and magnify light from objects billions of light-years behind them.

Newton wasn't wrong. He was incomplete. His equations still do the heavy lifting for spacecraft navigation and most of what matters in everyday observing. Einstein just picks up where Newton runs out of road — and in this universe, the road runs out more often than you'd think.

For those of us who spend time under dark skies, there's something personally resonant about this story. Two teams of astronomers, hauling equipment to remote sites, betting everything on one window of clear sky. One team got clouds. The other got data. Sound familiar? The universe doesn't make appointments, and it doesn't give second chances at a specific eclipse. Eddington's teams knew that going in — and they went anyway. The result, imperfectly measured and hotly debated, pointed the right direction. Every total solar eclipse we observe today, whether from our own backyard or a carefully scouted dark site, carries that same geometry, that same brief window, that same possibility of seeing something that changes how we understand things. You don't need a professional observatory. You just need to show up, point carefully, and take your time with the data.

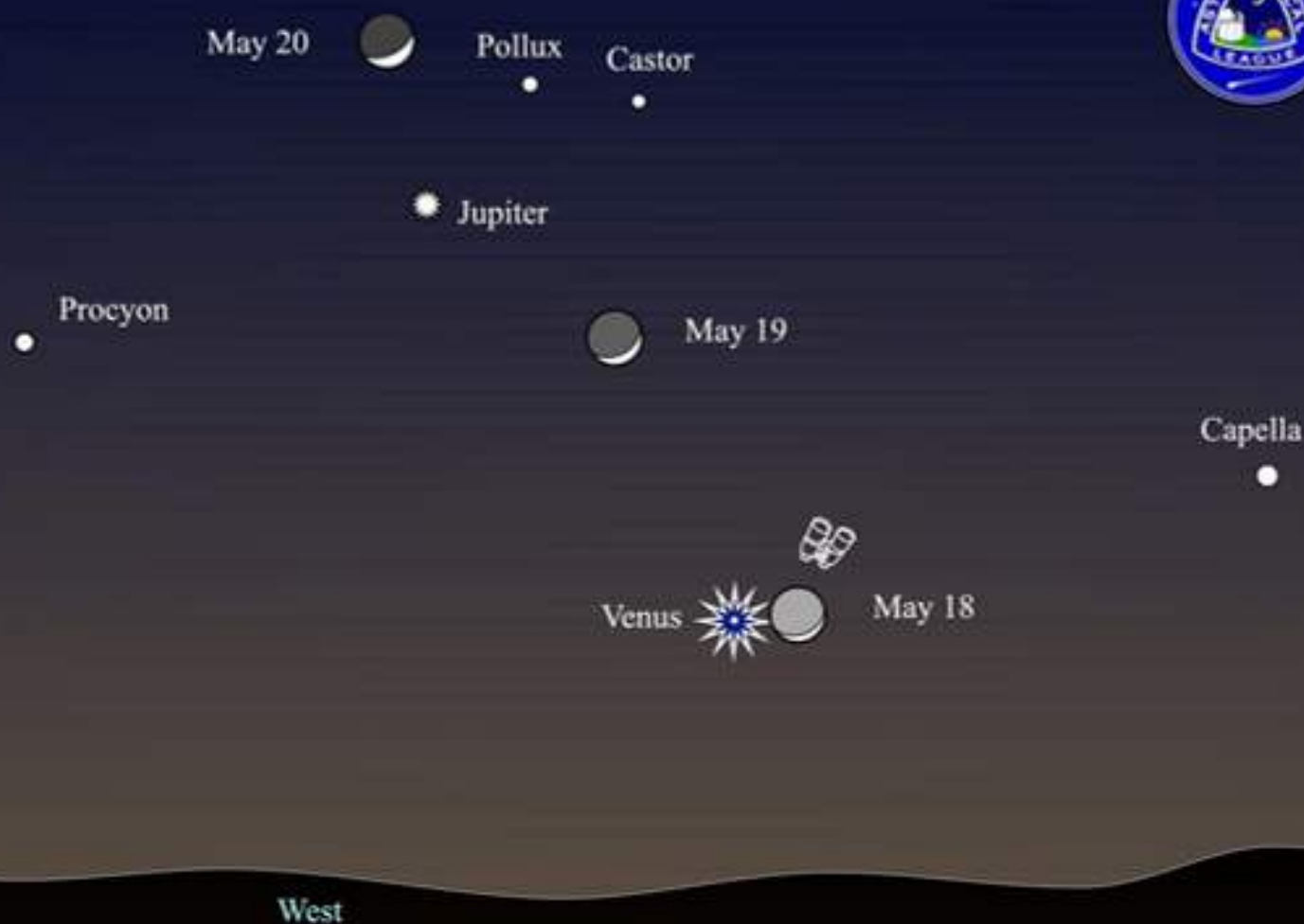
PRIMARY SOURCE — THE ORIGINAL 1920 PAPER

Dyson, Eddington & Davidson (1920). A Determination of the Deflection of Light by the Sun's Gravitational Field. Philosophical Transactions of the Royal Society A, 220, 291–333.

<https://w.astro.berkeley.edu/~kalas/labs/documents/dyson1920.pdf>



FIGURE 3- Public Domain,
<https://commons.wikimedia.org/w/index.php?curid=38550909>



**If you can see only one celestial event this month,
see this one.**

The crescent moon passing Venus then Jupiter

Look to the west-northwest 60 minutes after sunset on May 18, 19, and 20.

- On the first evening, the crescent moon full with earthshine glows immediately next to brilliant Venus.
- The next evening finds a somewhat thicker crescent moon sitting midway between Venus and Jupiter.
- On May 20, the moon lies above Jupiter and in a line with Castor and Pollux.
- The bright stars Capella and Procyon act as boundaries helping frame the scene.

End your day with this magical scene!

Astroimaging Special Interest Group (ASIG)

Your astroimages have been stunning—each galaxy spiral and nebular glow pushes our group’s passion deeper into the cosmos.

TIP: When your imaging software reports a value like “FWHM: 2.8””, it’s giving you one of the most useful indicators of image quality in astrophotography.

FWHM (Full Width at Half Maximum) measures how wide a star appears in your image at half its peak brightness. Since stars aren’t perfect points, they spread into small blobs due to atmospheric turbulence (seeing), focus accuracy, tracking, and optics. FWHM quantifies how tight or bloated those stars are—smaller values mean sharper stars.

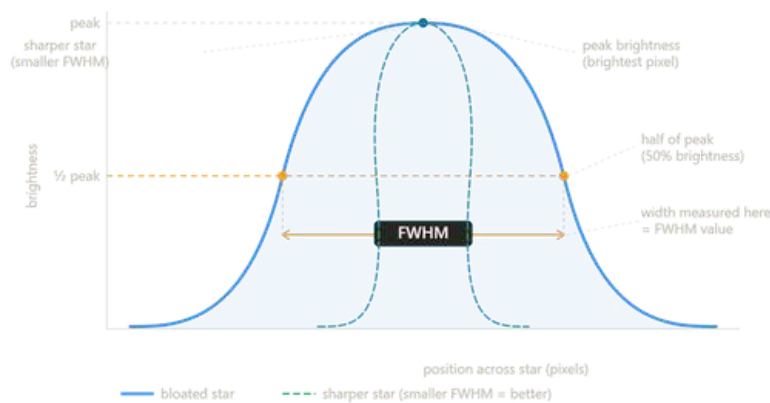
During autofocus in tools like NINA, FWHM is tracked as the focuser moves, forming a V-shaped curve. The lowest point of that curve represents best focus.

Under typical conditions around Scottsdale, you might see FWHM values in the 2–4 arc-second range, with exceptional nights dipping below 2”. However, these numbers depend heavily on your setup (focal length, pixel scale) and seeing conditions, so they’re best used as a relative benchmark for your own system, not a universal standard.

Many imagers use FWHM to filter their data, rejecting frames with noticeably larger values. Rather than relying on a fixed cutoff, it’s often more effective to discard frames that are significantly worse than your session’s average.

Bottom line:

Use FWHM to fine-tune focus and monitor image quality—but remember, it reflects the combined effects of seeing, tracking, optics, and focus, not just one factor.



Helpful YouTube channels

[AstroBackyard](#) – Excellent for beginner and intermediate astrophotographers, covering gear, imaging techniques, and post-processing.

[Nebula Photos](#) – Focuses on budget astrophotography, including DSLR and smartphone imaging.

[Peter Zelinka](#) – Great for nightscape and deep-sky astrophotography techniques.

[Chuck's Astrophotography](#) – Covers deep-sky imaging, processing tutorials, and equipment reviews.

[NSN Webinar Series: JWST: Revealing the Invisible Universe](#) - Principal Science Visuals Developer Joseph DePasquale will provide some background on the observatory and the art and science of image processing that reveals the inherent beauty of the infrared universe.

[Mastersofpixinsight](#) - Masters of PixInsight is an educational platform dedicated to teaching astrophotographers how to effectively use PixInsight for deep-sky image processing.

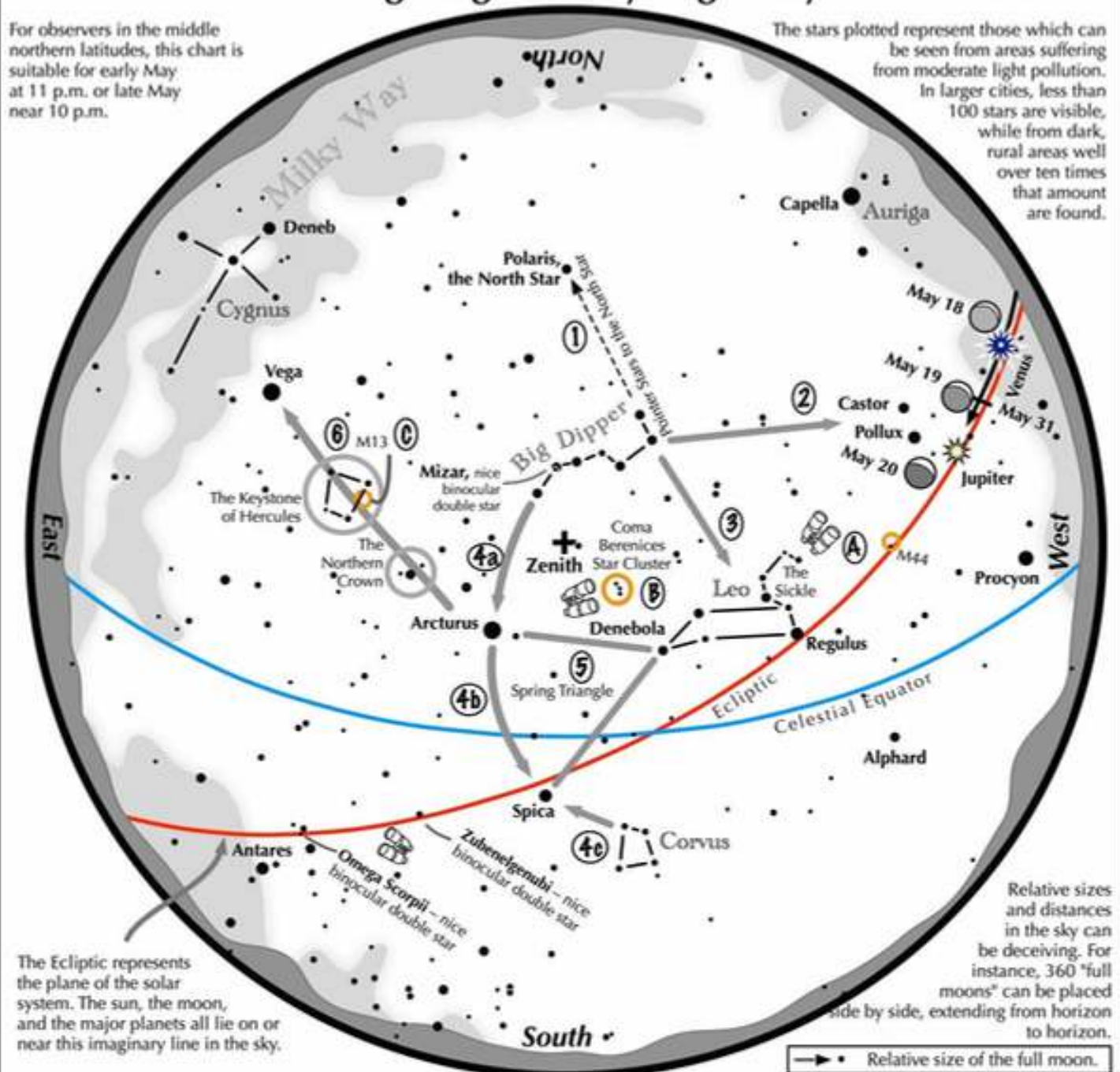
[20 Top TIPS for Better Astrophotography](#) - Dylan O'Donnell Dylan covers both image acquisition as well as processing and provides some great tips for better images.

Navigating the May Night Sky

2026

For observers in the middle northern latitudes, this chart is suitable for early May at 11 p.m. or late May near 10 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.

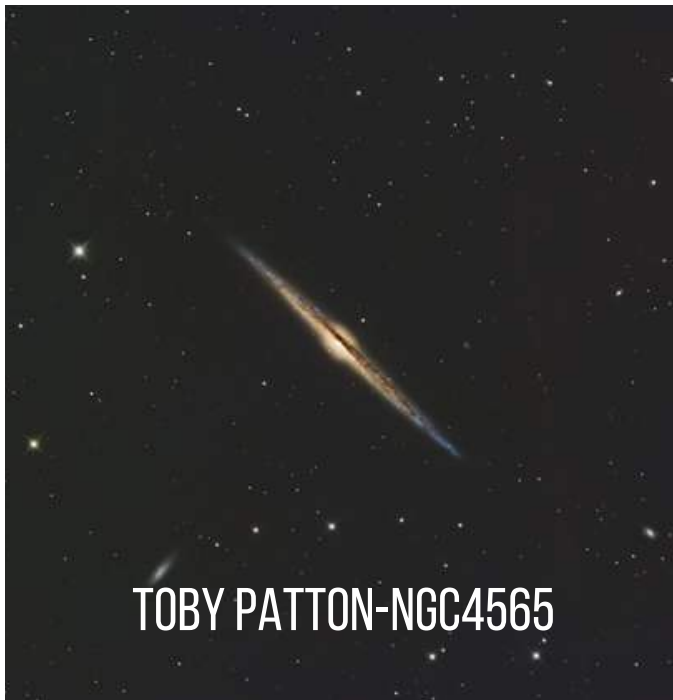
Navigating the May night sky: Simply start with what you know or with what you can easily find.

- 1 Extend a line northward from the two stars at the tip of the Big Dipper's bowl. It passes by Polaris, the North Star.
- 2 Through the two diagonal stars of the Dipper's bowl, draw a line pointing to the twin stars of Castor and Pollux in Gemini.
- 3 Directly below the Dipper's bowl reclines the constellation Leo with its primary star, Regulus.
- 4 Follow the arc of the Dipper's handle. It first intersects Arcturus, then continues to Spica. Confirm Spica by noting that two moderately bright stars just to its southwest form a straight line with it.
- 5 Arcturus, Spica, and Denebola form the Spring Triangle, a large equilateral triangle.
- 6 Draw a line from Arcturus to Vega. One-third of the way sits "The Northern Crown." Two-thirds of the way hides the "Keystone of Hercules." A dark sky is needed to see these two dim stellar configurations.

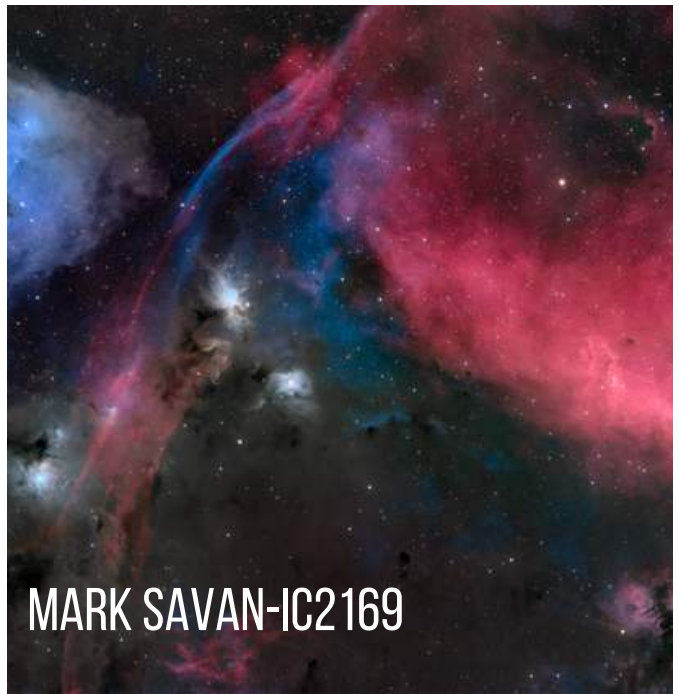
Binocular Highlights

A: M44, a star cluster barely visible to the naked eye, lies to the southeast of Pollux. B: Look near the zenith for the loose star cluster of Coma Berenices. C: M13, a round glow from a cluster of over 500,000 stars.

Astronomical League www.astroleague.org/outreach; duplication is allowed and encouraged for all free distribution.



TOBY PATTON-NGC4565



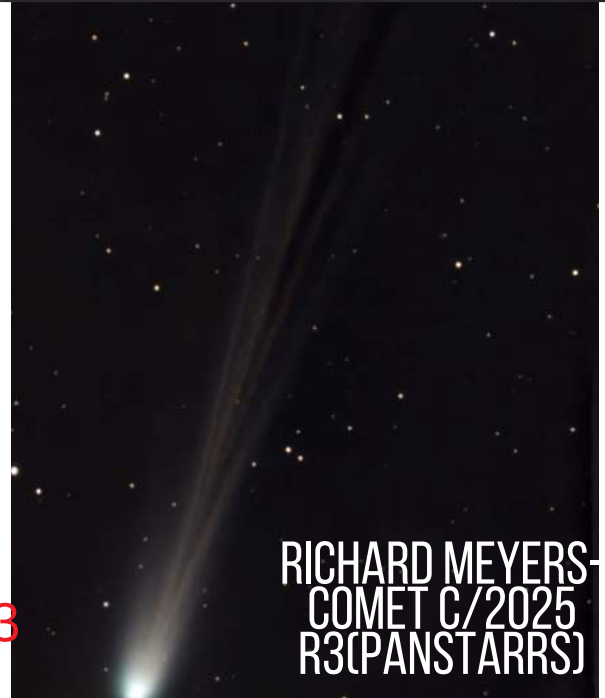
MARK SAVAN-IC2169



TOBY PATTON-WHALE



ANDREW STONE-M63



RICHARD MEYERS-
COMET C/2025
R3(PANSTARRS)

How do you find celestial objects?

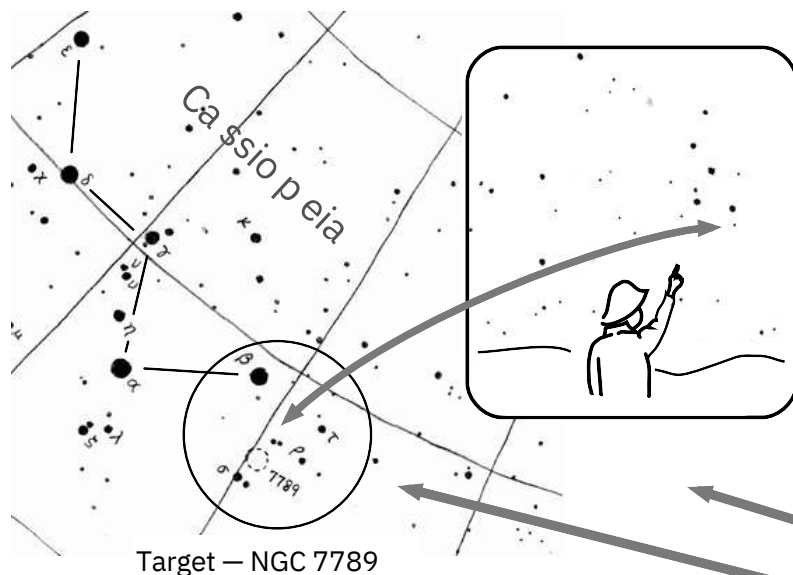
★ Finding celestial targets the modern way ★

Computerized "GoTo" telescopes ... the quick and easy method:

- 1 Level the telescope mount
- 2 Point the tube towards north
- 3 Indicate the date and time
- 4 Indicate observing location
- 5 Center on first guide star
- 6 Center on second guide star
- 7 Enter the target's designation
- 8 The scope automatically slews to it



★ Finding celestial treasures the old fashioned way ★



1 Learn the stars and constellations

- ★ There is no substitute for sitting under the stars with a map and red flashlight.
- ★ Use a star map that plots all stars visible to the unaided eye.
- ★ Start by finding well-known star patterns such as the Big Dipper, or the constellation of Orion or Cassiopeia.
- ★ Continue by identifying neighboring star patterns.

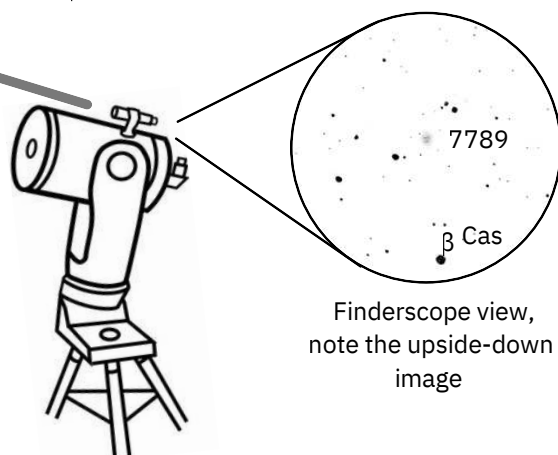
2 Finderscope: little scope, big view

Why a finderscope?

- ★ Gives a wide field of view, about 5°,
- ★ Must be aligned with the main telescope,
- ★ Only the bright planets, brighter nebulae and star clusters are visible.

Simply...

- ★ Point the finder at a suitable guide star, or
- ★ Triangulate to the object by using nearby recognizable stars.



Finderscope view, note the upside-down image

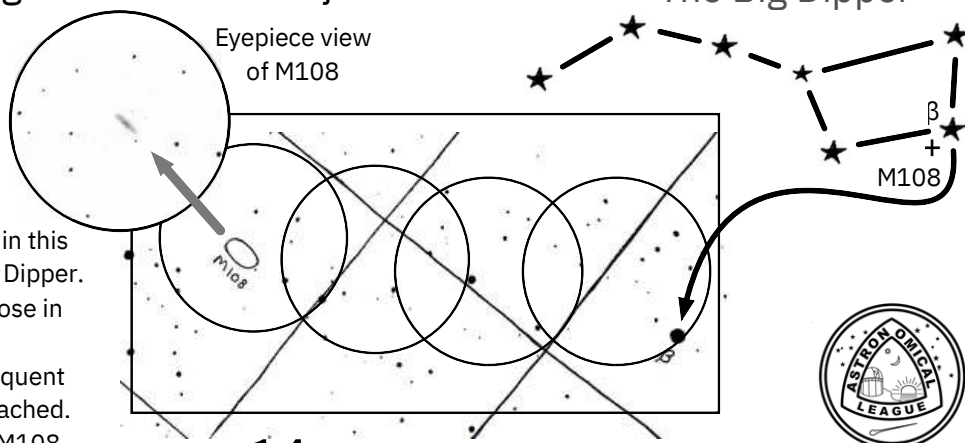
3 Star Hopping: finding the faintest of objects...

Before hopping begins:

- ★ Must have a **detailed** star map.
- ★ Must know the field of view of the eyepiece.

As an example, find galaxy M108:

- ★ Begin hopping at a reference star, in this case Beta (β) Ursae Majoris in the Big Dipper.
- ★ Match the stars on the map with those in the eyepiece.
- ★ Hop among the stars in each subsequent field of view until the correct field is reached.
- ★ Look closely to see the dim galaxy M108.



Helpful Astronomy Websites

by Mark Johnston

The following websites are great free resources to help you plan and enjoy your astronomy adventures

Astromart: astromart.com/

This is one of the top two sites for buying and selling used astronomy gear, product reviews, and forums where you can discuss any aspect of astronomy with other enthusiasts. A small fee is required.

Astrometry.net: <https://nova.astrometry.net/>

This site will take any astronomy image you send it (galaxy, starfield, nebula, etc) and then tell you what it is and where it is in the sky.

Astronomy Tools: astronomy.tools/calculators/field_of_view/

This site has a lot of capabilities but I use it primarily to figure out how a target (e.g. the Helix nebula) will look in my eyepiece or astronomy camera. You pick your scope, camera, eyepiece and target and the site does the rest.

Astrospheric: www.astrospheric.com/

Probably the best short term astronomy weather forecasting tool, providing predictions of clouds, transparency and seeing.

Clear Sky Charts: www.cleardarksky.com/

Excellent source of astronomy seeing conditions forecast. Also a great tool for finding observing sites with lower light pollution.

Cloudynights: www.cloudynights.com/

This is one of the top two sites for buying and selling used astronomy gear, product reviews, and forums where you can discuss any aspect of astronomy with other enthusiasts. Free.

Dark site finder: darksitefinder.com/map/

Great website for finding a dark observing location.

Heavens above: heavens-above.com/

Top site for predicting naked eye observations of satellites. See when the ISS is visible in your neighborhood!

Jupiter transits: shallowsky.com/jupiter/

For anyone with a small telescope, this is a great site. You can find out when the Great Red Spot and Jupiter's satellite transits are visible.

Solar Dynamic Observatory (SDO): <https://sdo.gsfc.nasa.gov/data/>

Find out how the Sun looks right now, at various wavelengths. If you own a solar telescope, this site coupled with Astrospheric is all you need to plan fabulous solar observing!

Starizona: <https://starizona.com/>

Astronomy store located in Tucson, Arizona. They specialize in a wide range of astronomy equipment and accessories, catering to both amateur and professional astronomers. Their offerings include telescopes, cameras, filters, and eyepieces, among other products. Knowledgeable staff and passion for astronomy.

Telescopius: telescopius.com/

This site is very helpful in planning an observing evening. It will tell you when any particular target is rising and setting and when is the best time to observe it. This allows you to sequence your observing in a planned manner.

Used equipment for sale

Duration: Ads run for 3 months and may be renewed if submitted by the deadline and space permits.

Cost: Ads are FREE for members only. Equipment Requirements: All items must be in good working order.

Acceptable items include books, star charts, telescopes, eyepieces, finder scopes, binoculars, lasers, and other astronomy-related gear. Submission Details: Email the following information to editor@pasaz.org:

*Make *Model *Description (Under 100 words-include a link to the manufacturer's site if available) *Price *Contact Information *Preferred Contact Method(Email or phone) *Approximate Location

PAS is not responsible for the ads and does not guarantee the quality of the items for sale. PAS reminds everyone, you purchase at your own risk, so do your research beforehand.

NEW

Posted 05/2026

MEADE ETX-LS 8" telescope for sale. Have instruction manual and 8X50 Rear Focus Viewfinder. \$1,400.00 or best offer. -Judy Pester (Paradise Valley) , judyloves356@gmail.com

Posted 04/2026

Celestron nexstar 6 se complete scope tripod brand new \$700.00. 847-833-8916 AJ Rozdilsky

SPECIAL OFFER

PAS offer: This is a first come, first served offer. Review the list. Decide what you want. Email president@pasaz.org what you want. He will set up a day/time for you to come to his location to purchase.

Bring your check payable to **Phoenix Astronomical Society** or cash ... no credit cards please.

Eyepieces for Sale

Brand	Model	Focal Length	Barrel Size	CN Price	Member Price
Orion	Deep-View	28mm	2"	\$79.00	\$40.00
Orion	LHD	20mm	2"	\$160.00	\$80.00
Orion	SuperWide	17mm	1.25"	\$80.00	\$40.00
Orion	SuperWide	13mm	1.25"	\$80.00	\$40.00
Orion	Edge-On Planetary	12.5mm	1.25"	\$68.00	\$34.00
Orion	Edge-On Planetary	6mm	1.25"	\$68.00	\$34.00

Telescope Loan Program

The PAS Telescope Loan Program provides PAS active members access to various donated telescopes and accessories to enhance their learning of visual astronomy as well as astrophotography.

Check-out Process: The entire PAS inventory of telescopes is available for active members to use. Some telescopes require completion of a training program, others do not. Several of the loaner telescopes represent a significant dollar value. In certain cases, the PAS member will be asked to provide credit card information as insurance against potential damage or loss.

A kit of eyepieces and accessories is available for all loaner telescopes if needed. There is also a special kit of advanced 2" eyepieces available for loan as well as advanced finder scopes. Laser collimation tools are also available for loan if needed.

Loan periods are for a maximum of one month. However, longer periods may be granted in special cases.

All telescope equipment and accessories must be picked up at the PAS storage facility and delivered back to the facility by the end of the loaner period. If you wish to check out one of PAS's telescopes, send an email to telescope@pasaz.org with the following information:

- Full Name
- Email Address
- Desired Telescope and/or accessory kit
- Check out date
- Check in date
- Additional information as needed

Askar 103 APO 103mm f/6.8 Triplet Refractor Telescope

With: Ioptron AZ Mount Pro and an advanced eyepiece kit Availability

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

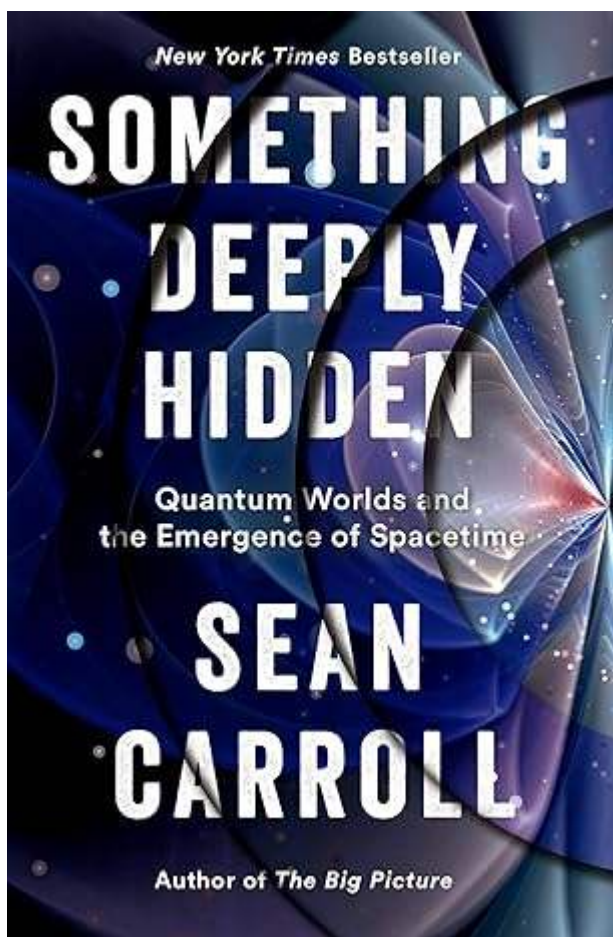
Accessory Kit #5 – 1.25" Eyepieces & filters





The 2026 Book Club

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

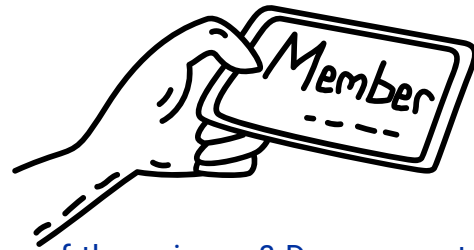


Sean Carroll's *Something Deeply Hidden: Quantum Worlds and the Emergence of Spacetime* (2019)

Sean Carroll, one of the world's most respected voices in science communication, reexamines the history of 20th-century physics with fresh clarity. In *Something Deeply Hidden*—already praised as a modern classic—he argues that confronting the central puzzle of quantum mechanics fundamentally reshapes our understanding of space and time. By seeking a true reconciliation between quantum theory and Albert Einstein's relativity, Carroll presents a perspective that could change everything.

For decades, much of the physics community has sidestepped an uncomfortable reality: the field has wrestled with unresolved foundational issues since 1927. Quantum mechanics, despite its predictive success, contains conceptual gaps that are often glossed over. Popular science tends to emphasize its strangeness, while academic culture has frequently steered researchers away from the so-called “dead end” of quantum foundations.

In this bold yet carefully argued work, Carroll challenges that mindset. He contends that the long-standing crisis in physics may finally have a resolution—if we are willing to embrace a radical implication: reality may consist of countless parallel versions of ourselves. Not just one observer, but many. Not just one universe, but an ever-branching multiverse.



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!



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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 PASTimes.

Star Tours Team 2026

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

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

