

January 2026

Monthly Newsletter



PAStimes

A Publication of the Phoenix Astronomical Society

In this newsletter
you can expect:

[Message From
The President](#)

[Earth Mass
Extinction](#)

[Season Change](#)

[247th AAS
Meeting](#)

[Navigating The
January Night
Sky](#)

[Double Cluster](#)

[Member Images ,
Book Review and
much more](#)

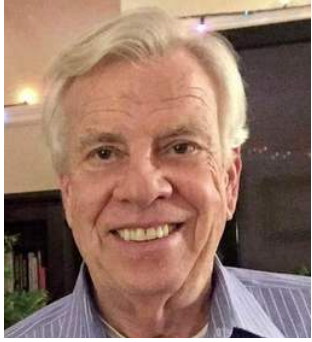
RICHARD SAUERBRUN - IC1848 SOUL NEBULA

8 – Monthly Lecture Series: Our Search for Other Habitable Worlds -Dennis Conti
| 15 – Telescope Workshop

| 17 – Book Club | 24-Public Star Party | 26 – ASIG Meeting



**EVENT
REMINDER**



It's a brand-new year with upcoming events, lectures, and lots more for you. The holidays have been keeping many of you busy, including your leadership team, planning exciting experiences for this new year. Plus, the winter sky is full of fun targets to view with your scope, binoculars or the naked eye.

We are working on more field trips here in Arizona like the ones to Lowell Observatory, the Mirror Lab and Kitt Peak National Observatory in Tucson last year. Plus a few dark sky parties for those willing to travel the extra miles. Our local star parties at Apache, telescope workshops and lectures are on our website events schedule.

I have been asked if children can come to our events, absolutely! Young people wanting to learn about the sky and this fun hobby are always welcomed. Babies in classroom lectures might pose a problem. But for sure involve your family to our events.

I am still looking for a creative person who can help organize our PAS history files. What we want to accomplish is an updating of our organization's rich history. We already have most of it done; we just need one of our generous PAS volunteers to carry it forward. Contact me: StuartBrackney@pasaz.org

Astronomy tip: Some of you have made a New Year's Resolution list. Great! We think you need a PAS activity list. This list is comprised of everything you will need to take with you when you head out to our star parties or on your own, with your telescope. Some, if not many of the best amateur astronomers, at times, have left important items behind resulting in the cramping or stopping their viewing all together. Believe us when we say you won't regret creating a list of everything you will need before heading out to view our universe.

From all of your Leadership Team,
Happy New Year everyone!

Stuart Brackney



Table Of Contents

Upcoming Events	3
Lecture	4
Recap	5,6
AAS Meeting	7
Outreach	8
Star Tours	9
Feature Articles	10,11
ASIG	12
Night Sky	13
Member Images	14
Targets	15
Cosmic Classroom	16
Astronomy Websites	17
For Sale	18
Telescope Loan	19
Book Review	20
Membership	21
Contact	22

JANUARY 2026 UPCOMING EVENTS



8
THUR

MONTHLY LECTURE SERIES

Our Search for Other Habitable Worlds -Dennis Conti-How scientists are going about searching for any sign of "life" on planets outside our solar system, namely on so-called "exoplanets."



15
THUR

TELESCOPE WORKSHOP

101/201

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



17
SATURDAY

BOOK CLUB

The Universe: A Biography , Murdin, Pau



24
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.



26
MON

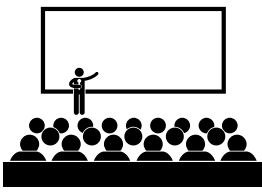
ASIG/ASTROIMAGING -

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.



January Lecture:Dennis Conti



World of Fire:

New Insights into Jupiter's Volcanic Moon Io from NASA's Juno mission.

Summary: This talk will present how scientists are going about searching for any sign of "life" on planets outside our solar system, namely on so-called "exoplanets." It will cover topics such as: the diversity of exoplanets, how we discover exoplanets, what constitutes "life" on exoplanets, how do scientists use bio-signatures and techno-signatures to determine if life possibly exists, and what are future missions to help us confirm if life exists beyond Earth.

Bio: Dennis Conti earned his M.S. and Ph.D. degrees in Computer Science from Purdue University. After retiring from a career in telecommunications with Hughes Network Systems, Dennis became an avid deep sky and planetary imager. He then moved on to the detection of exoplanets and currently is Chair of AAVSO's Exoplanet Section.

In 2016, Dennis headed up a collaboration of amateur astronomers around the globe who provided ground-based observations in support of a Hubble science team's study of some 15 exoplanets. Dennis is currently a member of the TESS exoplanet follow-up team and has worked closely with the TESS Science Team to qualify AAVSO members as official participants in the TESS ground-based follow-up program, with over 26 AAVSO members now part of that program. He also developed the TESS submission guidelines and the software for detecting false positives, both of which have benefited the entire TESS team.



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.



Here's a recap of last month's Meeting

World of Fire: New Insights into Jupiter's Volcanic Moon Io from NASA's Juno mission

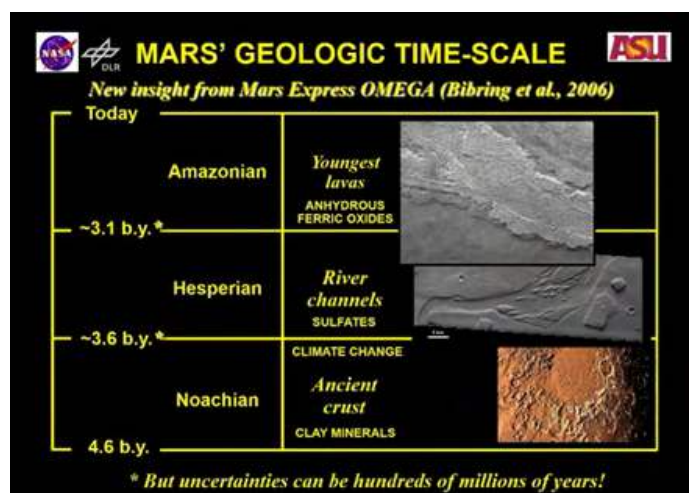
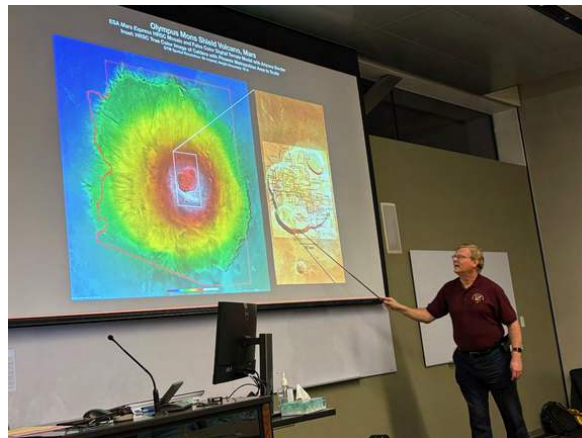
-Dr. Williams

Mars' geological history shows a clear transition from an early warm, wet world to the cold, dry planet seen today. During the Noachian period, Mars had abundant surface water, clay minerals, and active geological processes. As the atmosphere thinned, liquid water disappeared, leading to catastrophic floods followed by long-term drying. By about three billion years ago, Mars was largely desiccated, making long-term surface life unlikely.

Today, water on Mars exists mainly as ice, particularly in the polar regions, where layered deposits of water ice and seasonal carbon dioxide ice record past climate changes. Features once thought to indicate flowing liquid water on slopes are now mostly interpreted as dry granular processes, though rare briny seepage may occur. Methane detections remain one of the most significant unresolved questions. Methane could originate from geological activity or from subsurface microbial life, suggesting the possibility of habitable environments beneath the frozen surface. Resolving this question will require subsurface drilling.

Mars exploration has progressed through increasingly sophisticated robotic missions. Orbiters provide global maps of surface composition, topography, and atmospheric behavior. Landers and rovers have confirmed widespread volcanic, fluvial, glacial, and wind-driven processes. Curiosity continues to investigate climate evolution in Gale Crater, while Perseverance explores Jezero Crater, collecting rock cores for potential return to Earth.

A major technological milestone was achieved with the Ingenuity helicopter, which demonstrated controlled flight in Mars's thin atmosphere. Its success established aerial exploration as a new capability, enhancing rover operations and informing the design of future planetary missions. Overall, Mars exploration seeks to understand planetary evolution, assess past habitability, and prepare for eventual human exploration.



Here's a recap of last month's Meeting

**APOD Turns 30: The Best Space Images Ever from NASA's Astronomy Picture of the Day—Dr. Robert J. Nemiroff,
Professor of Physics at Michigan Technological University
Co-founder of NASA's Astronomy Picture of the Day (APOD)**

APOD—Astronomy Picture of the Day—launched in 1995 and has become one of NASA's most successful science outreach projects. Co-founded by Robert J. Nemiroff and Jerry T. Bonnell, it delivers one carefully curated astronomical image every day, paired with an accessible scientific explanation. Nearly 30 years later, APOD reaches over a million pageviews daily, is accessed by virtually every university, translated into about 20 languages, and mirrored across major social platforms.

Robert Nemiroff is both a working astrophysicist and a science communicator. His research spans gravitational microlensing, gamma-ray bursts, relativistic illumination fronts, and all-sky monitoring techniques. He also co-founded the Astrophysics Source Code Library, reinforcing APOD's connection between professional research and public understanding.

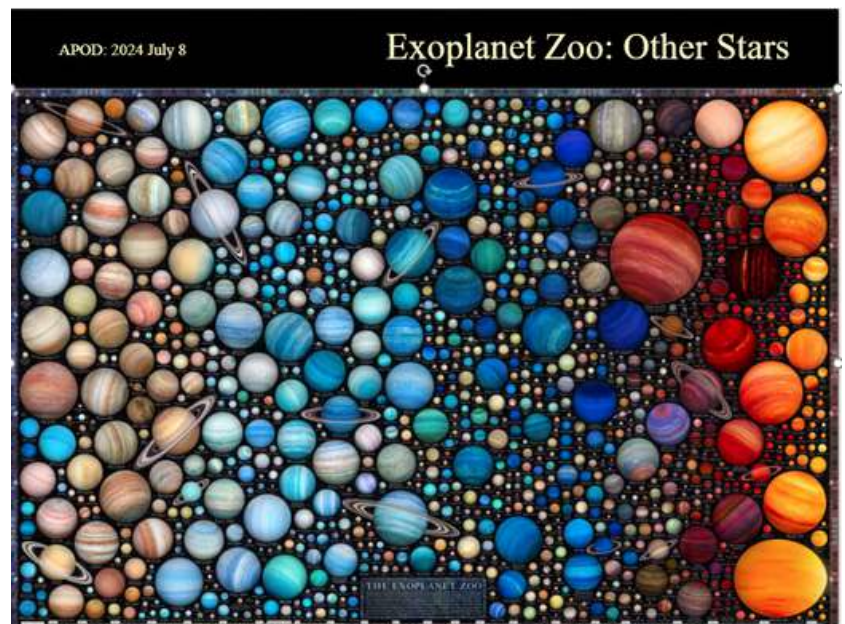
The presentation highlights APOD's impact through themed “best of” collections:

- Best Scientific: landmark discoveries such as the Hubble Ultra Deep Field, cosmic microwave background maps from Planck, gravitational waves detected by LIGO, and early supernova evidence for dark energy.
- Most Educational: visuals that teach core concepts—analemmas, Earth at night, eclipses, sundials, and human perspectives on planetary motion.
- Most Popular: striking, emotionally resonant images like aurorae, Moon–planet alignments, and time-lapse views of Earth.
- Most Visually Spectacular: iconic nebulae, dark clouds, galactic center radio maps, and art-science crossovers like Wanderers.

Special sections feature Phoenix-based APODs, recent highlights from 2025 (including Bennu sample science, interstellar comet imagery, JWST nebulae, and lunar landers), and cultural moments such as APOD appearing on Jeopardy!.

The talk closes by noting APOD's 2022 International Astronomical Union Outreach Prize, thanking the global community that sustains it, and promoting Nemiroff's popular-level book *Faster Than Light*.

Big picture: APOD proves that one excellent image a day—chosen carefully and explained clearly—can quietly educate the planet for decades.





247TH MEETING OF THE AMERICAN ASTRONOMICAL SOCIETY
PHOENIX, ARIZONA **4-8 JANUARY 2026**

The Super Bowl of Astronomical Sciences

Now Open to Amateur Astronomers

More than 3,600 attended last year's winter AAS meeting. Space is limited, so don't miss your chance to attend North America's largest astronomical sciences event under the dark skies in Phoenix!

AAS Affiliate Members Save Over 80% on Registration Fees.

See below how *S&T* subscribers and astronomy club members qualify to become AAS Affiliate Members

The Largest Gathering of Astronomers in North America

This is your gateway to four incredible days filled with cutting-edge astronomical science, dynamic presentations, breakout sessions, press conferences showcasing the latest discoveries, and a bustling exhibit hall — past exhibitors include NASA, NSF, SETI, NOIRLab, STScI, and equipment manufacturers including PlaneWave, Observable Space, Diffraction Limited, FLI, Unistellar, and Stellarvue.

Save over 80% on your registration as an AAS Affiliate Member

As a *Sky & Telescope* subscriber or an astronomy club member, you have an exclusive opportunity to join the American Astronomical Society as an Affiliate Member and unlock discounted registration to the 247th AAS meeting in Phoenix. Affiliate Members also receive discounts on American Institute of Physics (AIP) publications, special rates on the Annual Review of Astronomy and Astrophysics, plus other great benefits.

AAS 247 Phoenix, Arizona, 4-8 January 2026 — Come for the Meeting, Stay for the Vacation

HELPFUL LINKS

To register for AAS 247

To join AAS as an Affiliate Member

Register for AAS 247 as an Affiliate Member

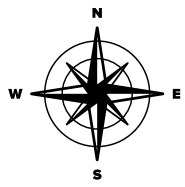




<https://aas.org/meetings/aas247/registration>

Why Attend?

- The largest astronomical event worldwide
- 4 days, over 80 sessions featuring the latest astronomical discoveries, press conferences, and plenary sessions presented by the rock stars of astronomy, planetary science, solar science, historical astronomy, etc.
- 3,600+ professional astronomers
- Universities, Planetariums, Museums, Private/Public Observatories, Private / Public Research Centers, companies involved in the space industry, federal agencies including NASA, NSF, plus more.
- 500+ amateur astronomers
- We are partnering with astronomy clubs and organizations like yours, providing amateurs discounted access to the entire 4-day meeting and exhibit hall.
- 80+ Exhibitors
- Featuring the latest and greatest astronomical equipment including the Sky & Telescope Pavilion featuring: Celestron, PlaneWave, QHYCCD, FLI, ZWO, Stellarvue, Sky-Watcher and many more!



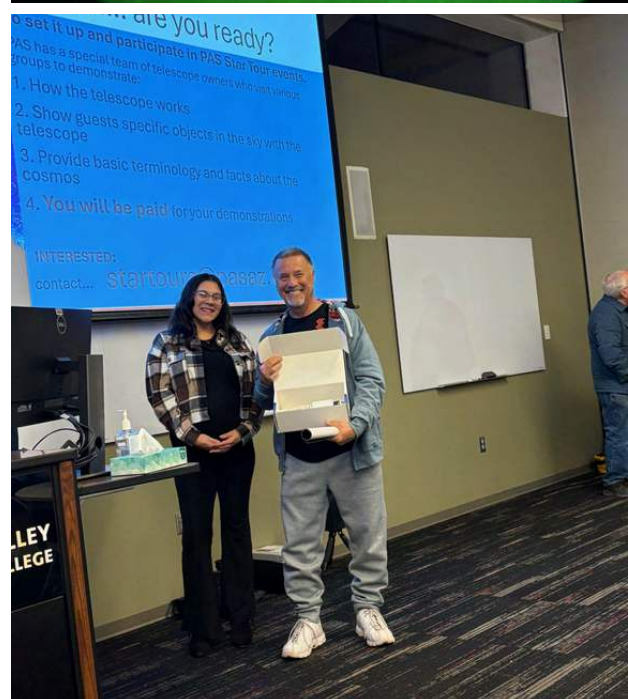
Summary of Outreach Events

Star Tours & Outreach events

11/29 Star Party Apache Wash: 2 EAA, 6 Visual
Scopes plus Night Vision with 20 visitors.

12/10 Dinner with Dr R. Nemiroff

12/15 Girl Scouts





StarTours by Andrew Stone

Objects to View in Jan 2026						
Object Name	Object Type	Constellation	Visual Magnitude	Apparent Size	Rise Time	Set Time
Saturn 🪐	Planet	Aquarius	0.6	18" (disk)	10:00 AM	9:35 PM
Uranus	Planet	Taurus	5.7	2.3" (disk)	2:40 PM	4:30 AM
Neptune	Planet	Pisces	7.8	4" (disk)	11:50 AM	11:35 PM
Jupiter	Planet	Gemini	-2.7	45" (disk)	4:30 PM	7:00 AM
M1 Crab Nebula	Supernova Remnant	Taurus	8.4	6' x 4'	4:30 PM	6:30 AM
M42 (Orion Nebula)	Emission Nebula	Orion	4	60' x 60'	5:30 PM	4:00 AM
NGC 2392 Eskimo Nebula	Planetary Nebula	Gemini	9.2	0.8'	5:00 PM	9:00 AM
NGC 7662 Blue Snowball	Planetary Nebula	Andromedae	8.3	0.5'	4:00 AM	11:30 PM
M31 (Andromeda Galaxy)	Spiral Galaxy	Andromeda	3.4	180' x 60'	11:00 AM	2:00 AM
M33 (Triangulum Galaxy)	Spiral Galaxy	Triangulum	5.7	70' x 40'	9:00 PM	4:00 AM
M81 & M82 Bode's Galaxy	Galaxy	Ursa Major	6.9 & 8.4	21' x 10' & 11' x 4'	7:30 PM	11:00 AM
Double Cluster (NGC 869/884)	Open Cluster	Perseus	4.3 & 4.4	30'	N/A	N/A
M35	Open Cluster	Gemini	5.3	28'	5:00 PM	7:30 AM
M36	Open Cluster	Auriga	6	12'	4:00 PM	6:30 AM
M37	Open Cluster	Auriga	5.6	24'	4:00 PM	6:30 AM
M38	Open Cluster	Auriga	6.4	21'	4:00 PM	6:30 AM
M41	Open Cluster	Canis Major	4.5	38'	7:30 PM	5:30 AM
M44 Beehive Cluster	Open Cluster	Cancer	3.1	95'	7:30 PM	9:00 AM
M45: Pleiades	Open Cluster	Taurus	1.6	1.5°	2:00 PM	4:30 AM
NGC 457: Owl Cluster	Open Cluster	Cassiopeia	6.4	13'	N/A	N/A
Achird Eta Cassiopeiae	Double Star	Cassiopeia	3.5 / 7.5	12'	N/A	N/A
Castor	Double Star	Gemini	1.6	5"	5:30 PM	9:00 AM

Sam Insana PAS Student Scholarship

Sam Insana PAS Student Scholarship

Winners:

- Jacinda Lopez
- Cody Creech

A huge “Congratulations” to both of you!

Your hard work, passion, and dedication have truly shined, and we’re thrilled to recognize your achievements with this year’s Sam Insana PAS Student Scholarship. Keep reaching for the stars—this is just the beginning of an amazing journey!

Earth's Mass Extinctions: Five Times Life Hit the Reset Button (and Lived to Tell the Tale)

By Cyrus Mousavi

Earth has been hosting life for about 3.8 billion years, which sounds impressive until you realize it has also been repeatedly trying to wipe that life out. Think of our planet less as a gentle caretaker and more as a stern editor—occasionally deleting entire chapters to make the story more interesting.

Scientists generally agree there have been five major mass extinction events, each defined by the rapid loss of a large percentage of species worldwide. None of them required villainous aliens or malfunctioning superweapons. Earth managed all of this perfectly well on its own.

1. The Ordovician–Silurian Extinction (≈444 million years ago)

Cause: Climate whiplash

Life lost: ~85% of marine species

The first mass extinction was also one of the coldest. At the time, life mostly lived in the oceans, happily unaware that Earth was about to turn the thermostat way down. A short but intense ice age locked up vast amounts of water in glaciers, lowering sea levels and destroying shallow marine habitats.

Then—because Earth enjoys irony—the ice melted, warming the planet again and depriving oceans of oxygen. Marine life was hit from both sides: freeze, then suffocate. Survival lesson #1: stability is underrated.

2. The Late Devonian Extinction (≈375–360 million years ago)

Cause: Probably too much of a good thing

Life lost: ~75% of species

This extinction didn't arrive with a bang but rather lingered like a bad guest who won't leave. It unfolded over millions of years and mainly affected marine life, especially reef-building organisms.

One leading theory blames the rise of land plants. As plants spread, they pulled carbon dioxide from the atmosphere, cooling the planet. Their roots also altered soils, washing nutrients into the oceans. That nutrient overload triggered massive algal blooms, which in turn sucked oxygen out of the water. The oceans became hostile, stagnant, and lethal.

In short: plants accidentally overachieved, and the oceans paid the price.

3. The Permian–Triassic Extinction (≈252 million years ago)

Cause: Volcanic apocalypse

Life lost: ~90–96% of species

This is the big one—the “Great Dying.” If mass extinctions had trophies, this would be the undefeated champion.

Colossal volcanic eruptions in what is now Siberia spewed greenhouse gases for hundreds of thousands of years. Temperatures soared, oceans acidified, oxygen levels crashed, and toxic gases may have seeped into the atmosphere.

Entire ecosystems collapsed. Insects nearly vanished. Forests disappeared. Marine life was decimated.

Life on Earth didn't just struggle—it barely survived. Recovery took millions of years, proving that while life is resilient, it also needs a very long nap after near-total annihilation.

4. The Triassic–Jurassic Extinction (≈201 million years ago)

Cause: More volcanism (Earth had a phase)

Life lost: ~80% of species

Just as ecosystems were getting comfortable again, massive volcanic eruptions split the supercontinent Pangaea apart. Lava flows, carbon dioxide spikes, climate chaos—it was déjà vu with a magma soundtrack.

This extinction cleared ecological space on land, allowing a group of survivors to rise to prominence: dinosaurs. For the next 135 million years, they would dominate the planet, presumably feeling pretty good about their timing. Lesson learned: sometimes extinction is just evolution's way of changing the cast.

5. The Cretaceous–Paleogene Extinction (≈66 million years ago)

Cause: Asteroid impact (finally, something cinematic)

Life lost: ~75% of species

-Continue-

This is the most famous extinction, largely because it ended the reign of non-avian dinosaurs and paved the way for mammals—and eventually, humans with podcasts. A roughly 10-kilometer-wide asteroid slammed into what is now the Yucatán Peninsula, releasing energy equivalent to billions of nuclear bombs. The impact triggered earthquakes, tsunamis, wildfires, and a dust cloud that blocked sunlight for months or years. Photosynthesis collapsed. Food chains followed.

Dinosaurs (except birds) were out. Mammals, small and adaptable, took their chance. Never underestimate the survival advantage of being furry, flexible, and fond of hiding.

Patterns in the Chaos

Despite their different triggers—ice ages, plants, volcanoes, asteroids—mass extinctions share a few themes:

- Rapid environmental change is deadly.
- Oceans suffer first and hardest.
- Life doesn’t disappear—it reorganizes.
- Recovery takes millions of years, not election cycles.

Each extinction reshaped life’s trajectory, eliminating dominant groups and opening niches for newcomers. Without the Permian extinction, dinosaurs might never have ruled. Without the asteroid, mammals might still be nocturnal background characters.

Are We in the Sixth?

Many scientists argue we are currently living through a sixth mass extinction, driven not by volcanoes or asteroids, but by a single species with opposable thumbs and a talent for fossil fuels. Habitat loss, climate change, pollution, and overexploitation are pushing extinction rates far above natural background levels.

The difference this time? We’re both the cause and the observers—and possibly the only mass extinction with PowerPoint presentations warning about it.

Earth’s history makes one thing clear: mass extinctions are not the end of life, but they are brutal plot twists. Life always rebounds, though rarely in ways the previous inhabitants would appreciate.

The dinosaurs ruled for over 100 million years and still got taken out by a bad day from space. Perspective, it turns out, is everything. So yes, Earth has had five mass extinctions. Life survived them all. The real question now is not whether life will endure—but which life, and under what conditions, gets the sequel.

- Cyrus



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.

Monthly Target Challenge:

Easy Targets (Small Telescopes & Binoculars)

- M1 – Crab Nebula (Taurus) - Mag 8.4 - Supernova remnant from 1054 AD, faint oval glow near Zeta Tauri
- M35 – Open Cluster (Gemini) - Mag 5.3 - Gorgeous cluster at Gemini's feet with dozens of stars in chains and curves
- M36, M37, M38 – Auriga Trio (Auriga) - Mag 6.0-6.3 - Three stunning open clusters in one field; M37 has beautiful orange central star
- Hyades Cluster (Taurus) - Mag 0.5 - Naked-eye "V" shape forming Taurus's face; best with binoculars

Challenge Targets (Large Telescopes)

- NGC 1535 – Cleopatra's Eye (Eridanus) - Mag 9.6 - Blue-green planetary nebula; use O-III filter at 150-200x magnification
- NGC 2244 + Rosette Nebula (Monoceros) - Mag 4.8 - Easy star cluster surrounded by challenging emission nebula; requires H-beta filter and dark skies
- IC 2118 – Witch Head Nebula (Eridanus) - Mag 13.0 - Extremely faint reflection nebula near Rigel; best photographed rather than observed visually

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.

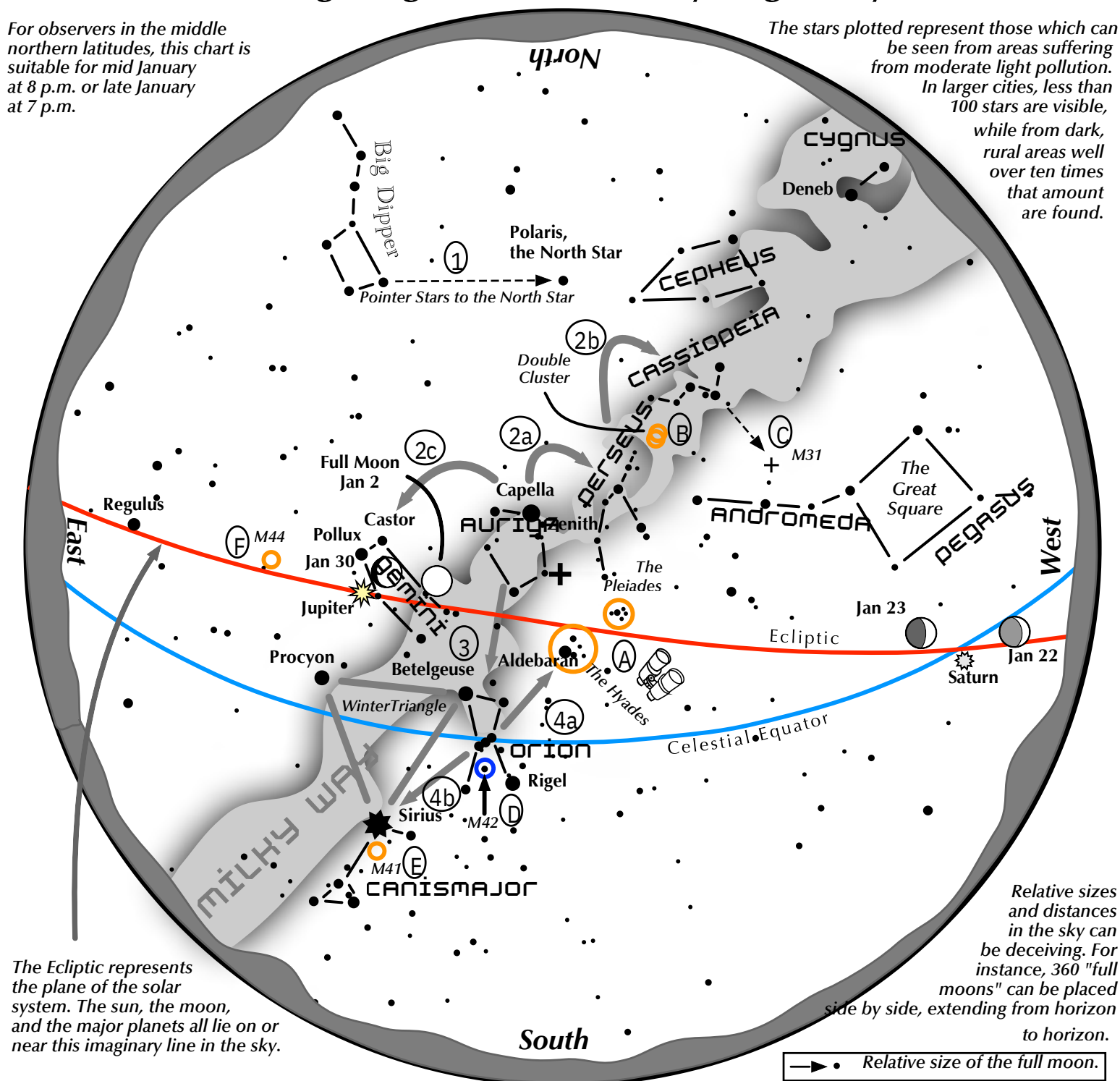
[20 Top TIPS for Better Astrophotography](#) Dylan O'Donnell Dylan covers both image acquisition as well as processing and provides some great tips for better images.

Navigating the mid January Night Sky

2026

For observers in the middle northern latitudes, this chart is suitable for mid January at 8 p.m. or late January at 7 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.

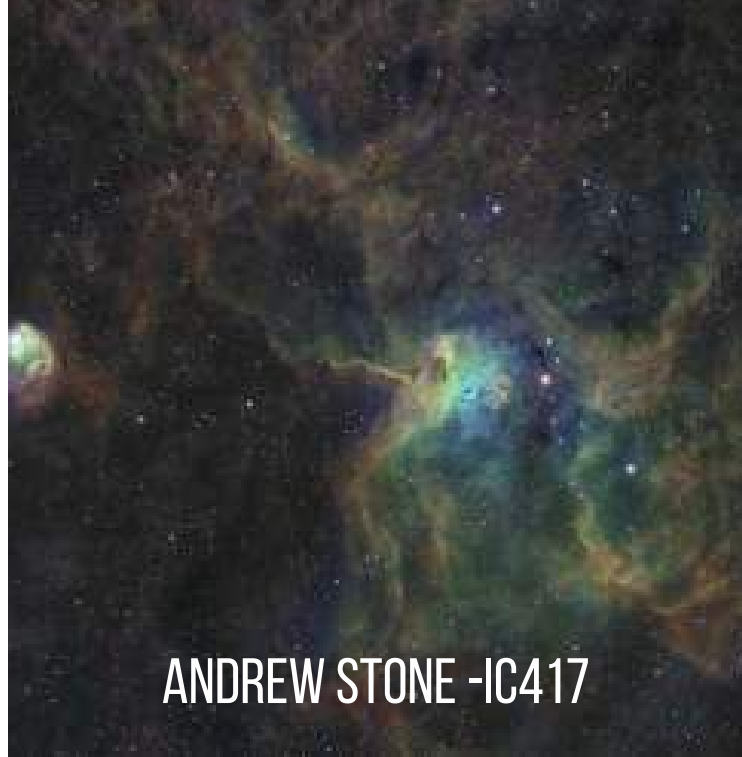
Navigating the winter night sky: Simply start with what you know or with what you can easily find.

- 1 Above the northeast horizon rises the Big Dipper. Draw a line from its two end bowl stars upwards to the North Star.
- 2 Face south. Overhead twinkles the bright star Capella in Auriga. Jump northwestward along the Milky Way first to Perseus, then to the "W" of Cassiopeia. Next jump southeastward from Capella to the twin stars Castor and Pollux of Gemini.
- 3 Directly south of Capella stands the constellation of Orion with its three Belt Stars, its bright red star Betelgeuse, and its bright blue-white star, Rigel.
- 4 Use Orion's three Belt stars to point to the red star Aldebaran, then to the Hyades, and the Pleiades star clusters. Travel southeast from the Belt stars to the brightest star in the night sky, Sirius.

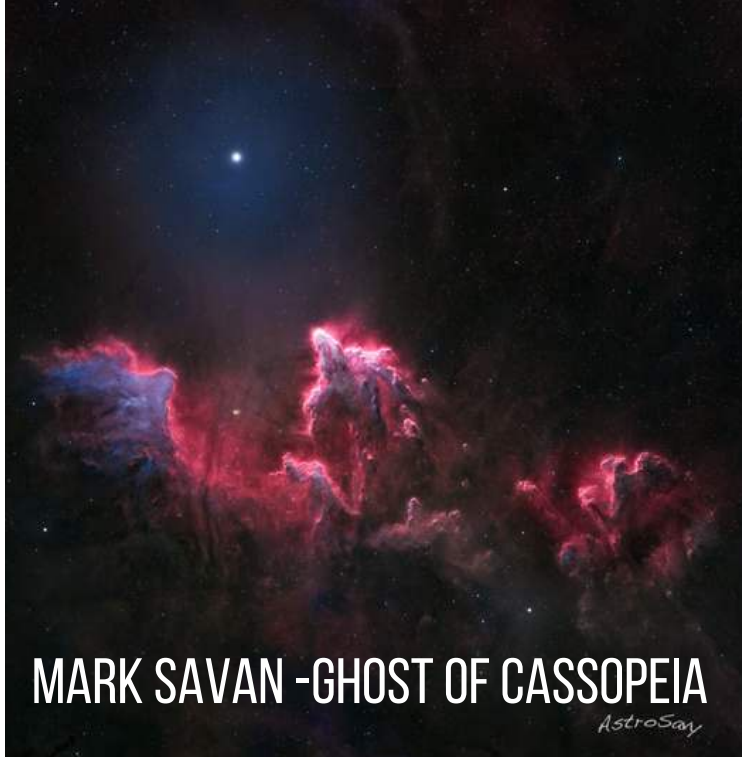
Binocular Highlights

A: Examine the stars of the Pleiades and Hyades, two naked eye star clusters. B: Between the "W" of Cassiopeia and Perseus lies the Double Cluster. C: The three westernmost stars of Cassiopeia's "W" point south to M31, the Andromeda Galaxy, a "fuzzy" oval. D: M42 in Orion is a star forming nebula. E: Look south of Sirius for the star cluster M41. F: M44, a star cluster barely visible to the naked eye, lies to the southeast of Pollux.





ANDREW STONE -IC417



MARK SAVAN -GHOST OF CASSIOPEIA

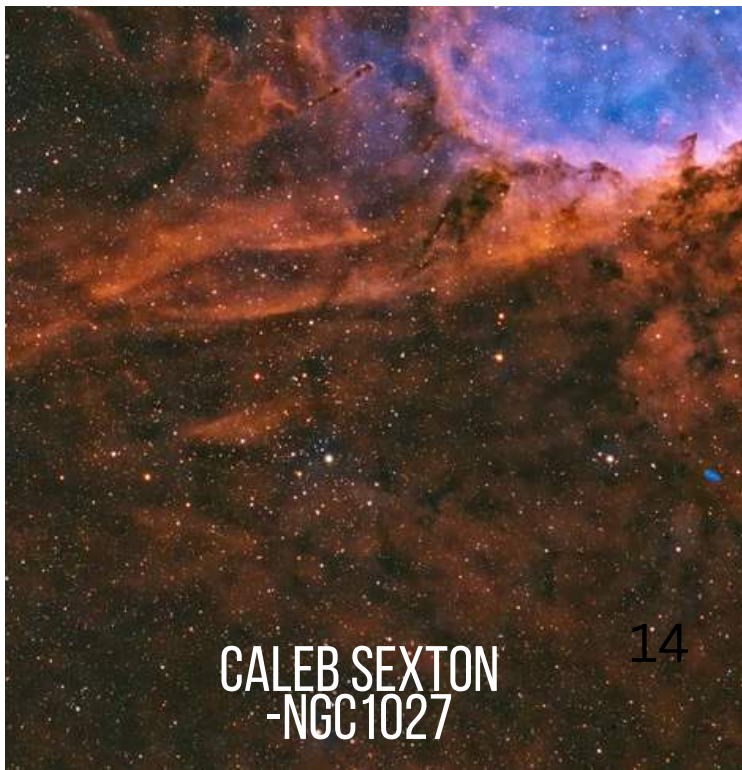
AstroSav



MARK JOHNSTON -SUN



TOM FLEMING-CTA 1



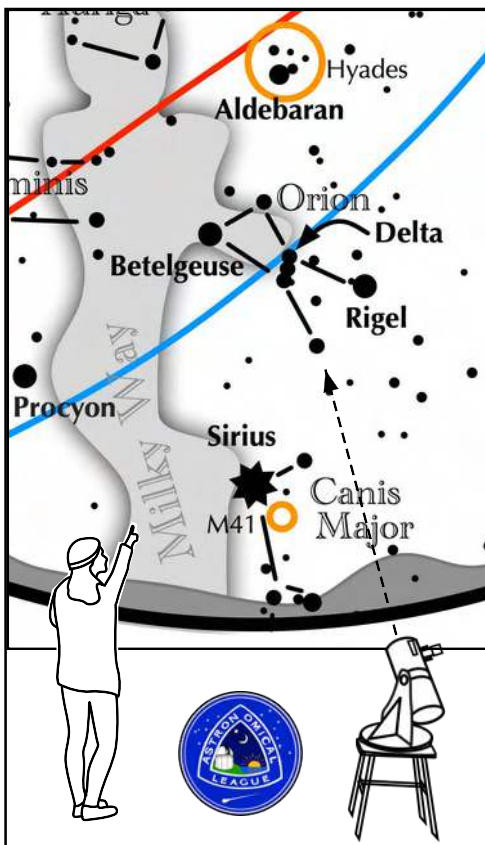
CALEB SEXTON
-NGC1027

7 Telescope Targets

Each month, we feature 7 good targets for small telescopes that should be visible in the evening. For the month of January, the targets are:

1. M42 The Orion Nebula The most spectacular nebula in the northern sky
2. The Trapezium Beautiful box of 6 stars that powers the Orion nebula
3. NGC2169 “XY Cluster” Fascinating star cluster that looks like an “XY” in space
4. Rigel Blue supergiant and an easy double for your telescope
5. Hinds Crimson star Deep red carbon star, looks like a stop light in space
6. M1 the Crab Nebula Nebula is the result of a supernova seen by the Chinese in 1054AD.
7. M35 star cluster Beautiful open cluster in Gemini

ASTRONOMICAL LEAGUE Double Star Activity



Other Suns: Delta Orionis (Mintaka)

How to find Delta Orionis on a January evening

Face southeast. Look at Orion above Sirius. Orion's Belt is the three stars of equal brightness between bright Rigel and Betelgeuse. Delta Orionis is the western star of the Belt. Delta Orionis

A-C separation: 53 sec

A magnitude: 2.4

C magnitude: 6.8

Position Angle: 0°

Colors:

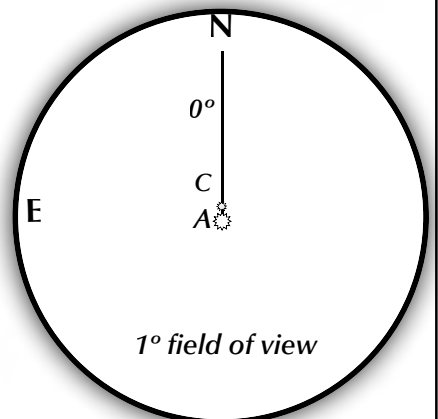
yellow-white

blue-white

Component B is a 14th magnitude star, not visible in most small telescopes.

Suggested magnification: >20x

Suggested aperture: >3 inches



Seasons change, Stars change

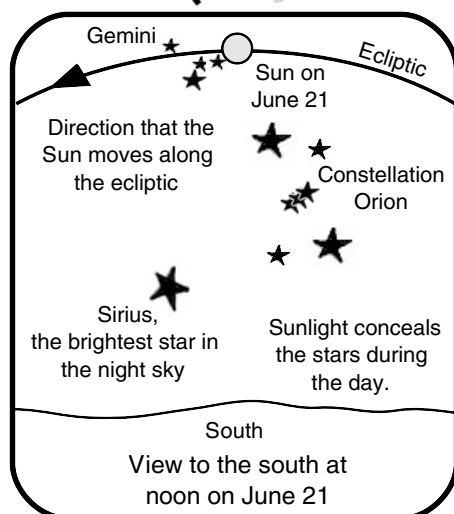
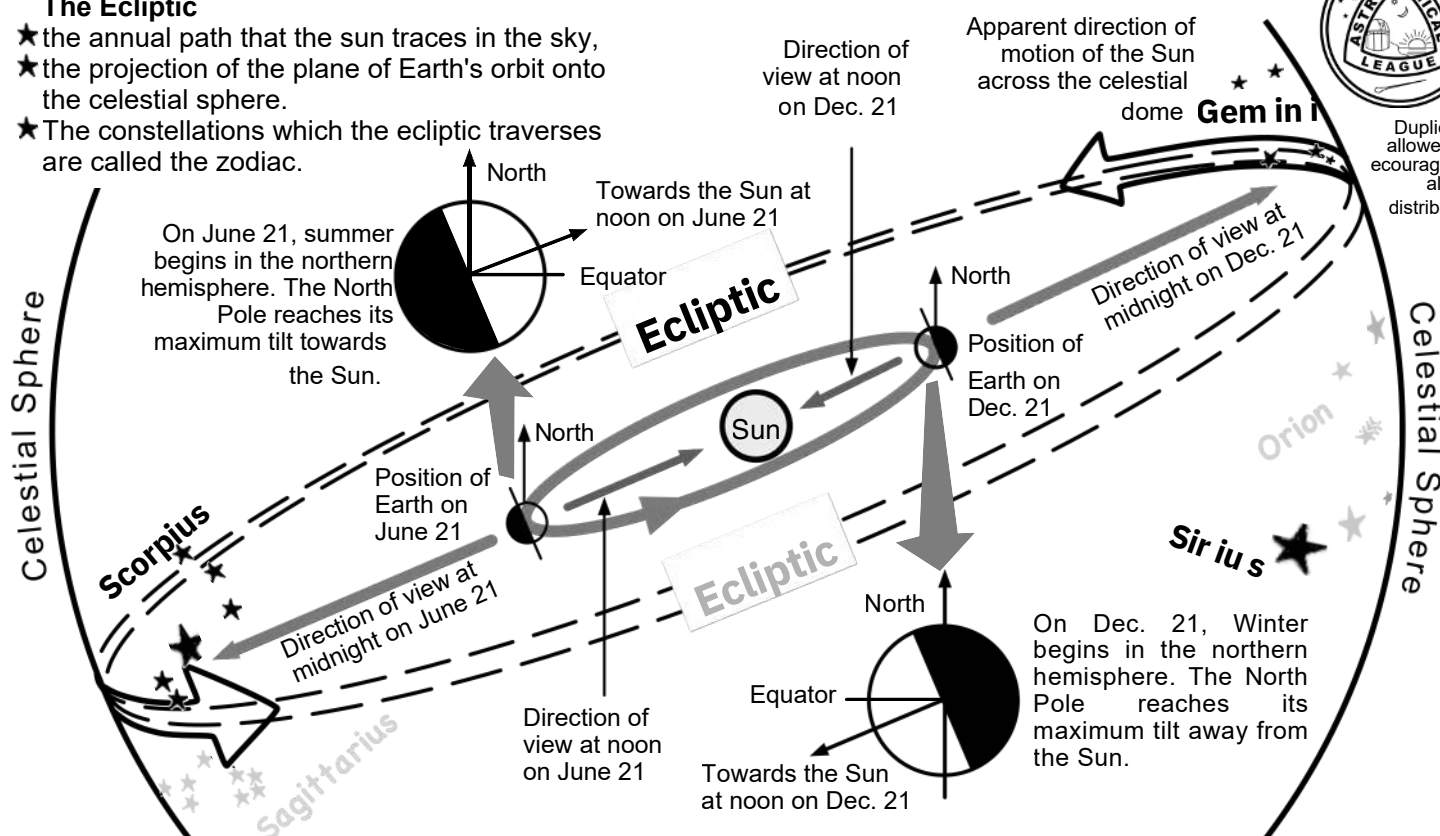
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The Ecliptic

- ★ the annual path that the sun traces in the sky,
- ★ the projection of the plane of Earth's orbit onto the celestial sphere.
- ★ The constellations which the ecliptic traverses are called the zodiac.

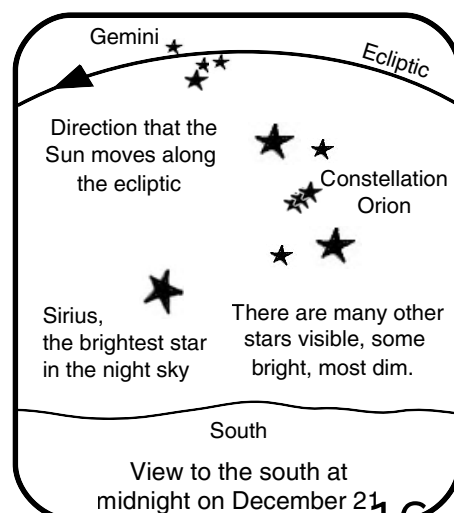
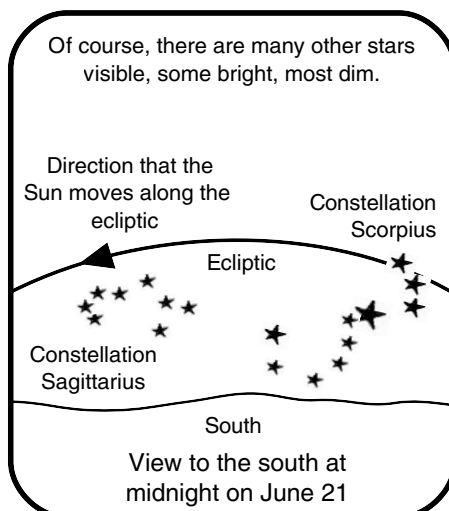
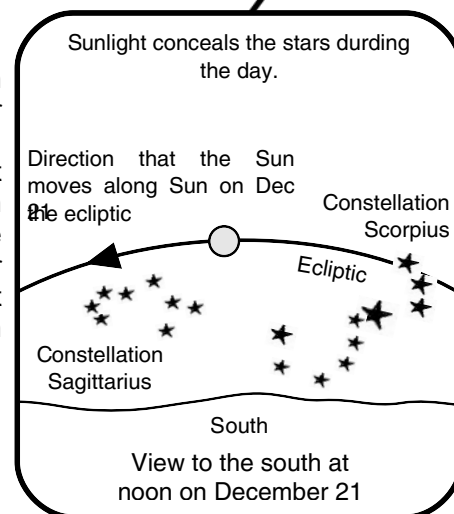
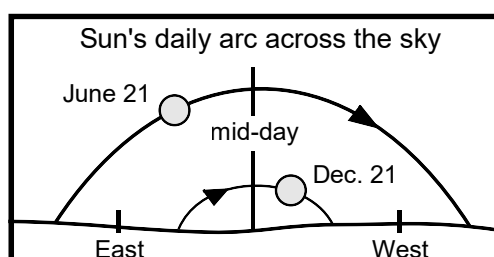


Consider that ...

- ★ the Sun is higher at noon in June than in December, the Sun is slightly farther from Earth in June than in December,
- ★ the stars that are in the midnight December sky are the same stars in the noon June sky, and vice versa, the ecliptic is high at midnight in December and at noon in June, and it is low at noon in December and at midnight in June.

Also consider that ...

- ★ the Sun always lies directly on the ecliptic line, moving two of its own apparent diameters to the east each day, (The Sun's diameter is 0.5 degrees. It moves 1° each day.) it takes the Sun 365.25 days to complete one circuit around the ecliptic, and the Moon and the planets lie either on or near the ecliptic.



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.

Posted 12/2025 Thinning the herd a little bit more. 41MM Panoptic, body is in great condition. Optics are clean with no blemishes. Includes paperwork on features and design. Price on the Panoptic is \$450, Price includes PayPal and shipping to the lower 48. Any questions? Please get in touch. m42astronomer@gmail.com



NEW

Posted 1/2026 Maxvision EXOS-2/EQ5 GOTO Mount w/1.5-inch steel tripod w/Bresser ASCOM SW&Cable \$449.95
<https://www.ebay.com/itm/167985261719>

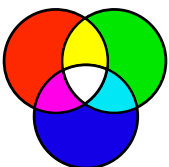
NIKON D5100 DSLR Astronomy Camera /Full-Spectrum Astro Modified \$289.95
<https://www.ebay.com/itm/167989296026>

Explore Scientific iEXOS-100 Go To Equatorial Mount w/Tripod & Azimuth Adjuster
\$249.95 <https://www.ebay.com/itm/168021245863>
Contact : Mathew A. Taylor mathewallantaylor@gmail.com



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.



Various Filters – 1.25"

Red, Yellow, Blue, Green, Multiple O3 filters

Member Price: \$100

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

ZWO SeeStar S50

Coronado Personal Solar Telescope (PST)

Orion SkyQuest XT-10 - 10" Dobsonian

Orion Skyquest XT-8 – 8" Dobsonian

Meade ETX-70 Go-To Refractor

Sky-Watcher – 10" Collapsible Motorized Dobsonian

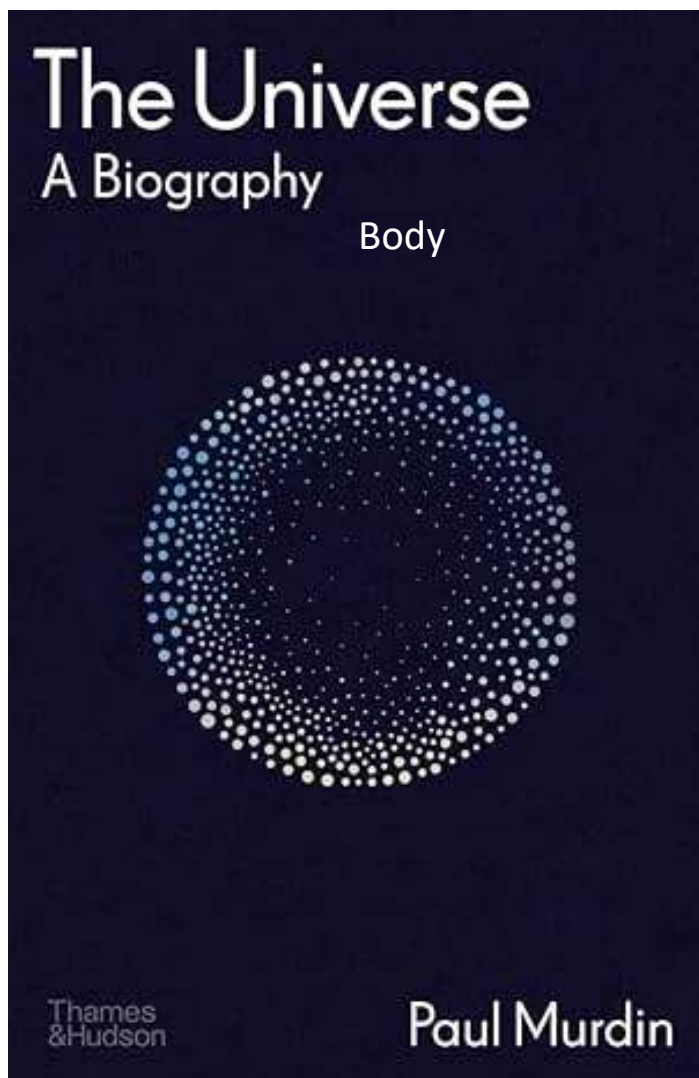
Accessory Kit #4 - Advanced Observing

Accessory Kit #5 – 1.25" Eyepieces & filters





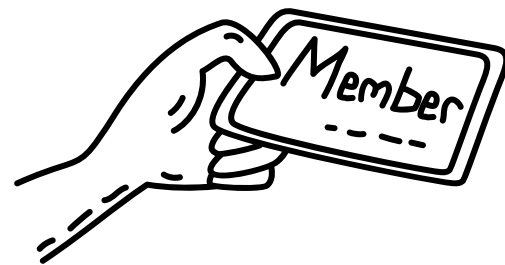
The 2026 Book Club kicks off with *The Universe*. We'll be covering the first five chapters, and everyone is welcome to attend and participate in the discussion. For more information or to join, contact Cyrus at saeidmousavi@yahoo.com



Paul Murdin's *The Universe: A Biography* takes a big, sweeping topic—the history of the cosmos—and turns it into a readable narrative that feels like a life story with a beginning, middle, and (possible) end. Murdin, an astronomer who helped identify the first stellar-mass black hole in our galaxy, organizes the book chronologically from the Big Bang through galaxy formation, the birth of stars and planets, and eventually to Earth and the future of the universe. Rather than a dry textbook, this book reads like a voyage through time, blending core concepts of astrophysics—black holes, dark matter, cosmic expansion—with the human endeavor behind those discoveries.



Sign Up



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

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Star Tours Team 2025

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

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

