



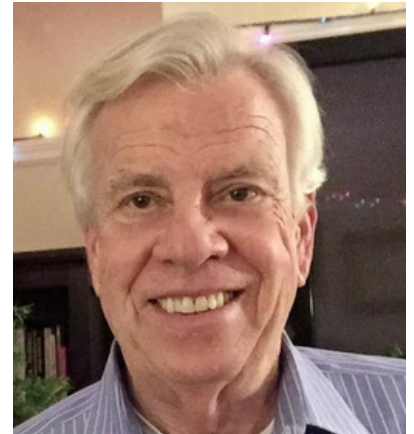
PAStimes

A Publication of the Phoenix Astronomical Society

Stu's Views • Stu Brackney, President PAS

Hi everyone. Well, we are one busy group of amateurs. Star parties, workshops, lectures, Star Tour Events, PAsTimes newsletter, student scholarships and of course our new telescope loaner program, which is getting a lot of attention, as we have eight telescopes for "members only" to use for two weeks or more if needed. Interested? Contact telescope@pasaz.org.

Winter nights have been giving us some, not a lot, of dark nights to view Jupiter, the Orion Nebula, the Moon, and of course the "Seven Sisters" the Pleiades, along with other "deep sky objects." Safety reminder: if you head out to do some viewing, please take a friend and let others know where you will be.



Another friendly reminder, your board and managers can only do so much to make things happen at PAS. We still need one more volunteer to assume the position of Event Manager. Please seriously consider this position as your way to be a part of PAS by contacting me at: stuartbrackney@pasaz.org.

Six weeks, a little under six weeks from now. Circle your calendar **April 8th**. The cosmos will be displaying one of its major events, a **solar eclipse**. Your PAS is scheduled to be out there with telescopes and solar eyeglasses. If you have never experienced this event through a telescope, time to register at our website: Partial Solar Eclipse. Tell and bring a friend. If you have a telescope, be sure to bring it and your solar filter with you.

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March Upcoming Events

March 2024 brings our normal schedule of events, plus two special chances to bring your binoculars and/or telescope to enjoy a spectacular view of the cosmos.

March 7th – Monthly Lecture Series - "What is next in The Chinese Lunar Exploration Program?"

March 9th – Public Star Party – Dark site event at the Antennas west of Phoenix

March 16th – International Observe the Moon Night

March 21st – Telescope Workshop 101 – What to Buy

March 21st – Telescope Workshop 201 – Operating Your Telescope

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.

March Lecture Series

The March 7, 2024, speaker is Dr. James W. Head. The title of his presentation is: "What is next in The Chinese Lunar Exploration Program?"



China has embarked on an ambitious and fast-paced robotic lunar and planetary exploration program, including the first lander and rover on the far side of the Moon, lunar sample return missions (Chang'e 5 samples recently being returned from the unexplored NW lunar nearside), Chang'e 6, the first lunar far side sample return mission scheduled for launch in mid-2024, rovers on the surface of Mars, and missions to many other destinations in the Solar System. Plans also call for Chinese astronauts to explore the Moon by the end of the decade. What is the scope, significance and direction of the Chinese space program and how does it differ from that of the US and other countries? We will put particular emphasis on the upcoming Chang'e 6 lunar far side robotic sample return mission, and touch on Tianwen-1, the recently successful Mars rover mission Mars and China's upcoming Tianwen-3 Mars sample return mission.

James W. Head III is the Louis and Elizabeth Scherck Distinguished Professor in the Department of Earth, Environmental and Planetary Sciences at Brown University. He earned an undergraduate degree from Washington and Lee University (BS, 1964) and received his PhD from Brown University in 1969. From 1968 to 1972, while serving at NASA Headquarters (Bellcomm, Inc.), he participated in the selection of landing sites for the Apollo program, in training Astronaut crews in geology and surface exploration, in planning and evaluating the package of experiments to be deployed on the Moon, in mission operations in Houston during lunar surface exploration, and in preliminary analysis of the lunar samples returned by the Astronauts. He has written many research papers, he has been involved in many research projects and activities, and he is a member of many research organizations. He has received many national and international awards and recognition for his work and contributions.

There will not be a "Meet and Greet the Speaker" dinner before the meeting because he will be presenting remotely.

For more details and to register for the meeting and presentation go to the PAS Event Calendar and Registration Site: [PAS Event Calendar and Registration Site](#)

It is important to register for events. In case of changes, you will be notified.

Greg Brennecka was the speaker at the February 1, 2024 Lecture By Paul Facuna

The title of Dr. Brennecka's presentation was "Meteorites: Their incredible influence on our planet, culture, and origins." The title summarizes his presentation – meteorites influence on the formation of the earth, how they may have contributed to the beginnings of life on earth, how various cultures that saw meteors fall interpreted the event many times religiously, how ancient civilizations used metallic meteorites when found, such as the meteoritic iron dagger found in King Tutankhamun's tomb, and how meteors may have formed in our solar system. A current idea is that a large object, possibly a proto-planet or meteoritic object, struck the young earth and the debris from the impact formed the moon and some fell to earth. Later meteorites brought some simple organic molecules to the earth that may have been involved in the beginning of life on earth. Simple organic molecules have been found in pristine samples from asteroids Itokawa, Hayabusa, Ryugu, Bennu, and possibly the Murchison meteorite. Among the molecules found were 3 of the 4 RNA nucleotide bases and 2 of the 4 DNA nucleotide bases. Also covered was the cosmolocation (formation location) of meteors in the forming solar system and the isotopic comparison of the earth and various categories of meteorites and the differences in chemical composition of the sun, earth, and meteorites. It was an excellent presentation.



Our very own Mark Johnston was featured on the cover of Scottsdale Republic on February 14 2024 discussing Dark Sky Cities.

SCOTTSDALE REPUBLIC

MIDWEEK, 02.14.24 | Z8 SECTION SR | SCOTTSDALE.AZCENTRAL.COM

PART OF THE USA TODAY NETWORK

DARK SKY CITIES

Arizona boasts more than 20 areas that are good for stargazing and great for health.

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Find something fun to do this week

PAGE 2

Mansion torn down to be replaced

PAGE 4

Buying a home? Research your water

PAGE 7

Mark Johnston, one of NASA's solar system ambassadors, works with astronomers in Arizona who want to learn about what's in the sky. COURTESY MARK JOHNSTON

February Outreach Events

The PAS outreach program included several excellent events in February.

Public Star Party

A very small group of people visited our Apache Wash Trailhead star party site on Saturday the 10th for our public star party. Only five PAS members attended and only four had their telescopes for an evening of viewing. The daytime was quite cloudy and included some scattered areas of light showers. But, as predicted, the clouds moved on, the rain stopped, and the skies were clear by the start of the event. Remember ... if you register for an event, it is "ON" unless you receive an email notification of cancellation or a change.

Star Tours – Sonoran Sky Elementary School

The Star Tours outreach program held an event for the Sonoran Sky Elementary student body on the 7th. Roger Anzini and Ted Blank served as telescope operators, and Pete Turner displayed his meteorite collection.

Star Tours – Black Mountain Elementary School

The Star Tours outreach program participated in an event at the Black Mountain Elementary School on the 8th. Mason Klenklen operated two telescopes, Richard Sauerbrun displayed his EAA setup and provided various planetary views. Scott Adams made a multimedia presentation on the difference between what you see visually through a telescope and what is visible with an astro camera, and Roger Anzini displayed his meteorite collection.



Telescope Workshop 101 – What to Buy

February's 101 workshop on the 15th at PVCC was taught by Stu Brackney. Four individuals attended who were looking for assistance with buying their first telescope.

Telescope Workshop 201 – How to Operate My Telescope

February's 201 workshop on the 15th at the Apache Wash Trailhead was taught by Damon Finnel, Richard Pipkin, and Richard Sauerbrun. A total of three students showed up with their telescopes and received tips and instructions to improve their observing skills.



February Outreach Events continued

Star Tours – Lone Mountain Elementary School

The Star Tours outreach program participated in the Lone Mountain Elementary STEAM night on the 21st and Pete Turner displayed his meteorite collection.

Star Tours – La Puesta Del Sol

The Star Tours outreach program also participated in the La Puesta Del Sol event at Fort McDowell on the 21st with Andrew Stone operating his visual telescope setup.



Star Tours – Legally Brooke Real Estate

The Star Tours outreach program tried something new on the 22nd assisting a real estate broker promote the sale of a high-rise condominium in downtown Phoenix. Stu Brackney and Richard Sauerbrun entertained a crowd of visitors with views of the night sky high above the city lights.

Star Tours – Wild Horse Pass

The Star Tours outreach program went south of Phoenix on the evening of the 27th to make a presentation to approximately 350 guests at the Sheraton Grand Hotel and Wild Horse Pass Casino. Stu Brackney served as host with Mason Klenklen and Richard Sauerbrun serving as telescope operators for the 4-hour event. Skies were partly cloudy at the outset, but cleared to provide some great views of Jupiter, the Orion Nebula, the Pleiades, and various double stars.



Star Tours – Desert Sage Elementary School

The Star Tours outreach program participated in the Desert Sage Elementary School's winter STEM event on the 28th with Pete Turner presenting his meteorite collection.

Member Astro Images

Chiricahua Astronomy trip by Mark Johnston and Mark Savan

As soon as the rain ended after the recent new Moon, Mark Savan and I traveled to the Chiricahua Astronomy Complex for 3 nights of dark sky imaging. This is a fully developed dark site owned by the [Tucson Amateur Astronomy Association](https://tucsonastronomy.org/) (https://tucsonastronomy.org/) and includes powered observing pads, warm room, showers, bathrooms, sleeping quarters, high-speed wifi, and access to numerous high-end telescopes.

The skies here are bortle 1.5 with the winter Milky Way clearly visible beside Orion. Omega Centauri and M13 were naked-eye targets. I brought 3 telescopes and a DSLR and got quite a few great images. Some attached examples I took are the Witch Head nebula, the Dolphin Head nebula, M51, and a wide-angle view around Orion's belt.

In addition, Mark S was imaging through 3 telescopes including the Celestron 14" SCT that is one of the Complex's telescopes that is available to qualified members. The attached image of M1 (Crab Nebula) was taken with this system



m51



mid orion



she-308 bi



witch head



m1 crab nebula



7 Telescope Targets for March

Each month we feature 7 good targets for small telescopes that should be visible in the evening

1. Iota Cancer: Beautiful, easy to split colorful double star
2. M44: the Beehive Large open star cluster in Cancer
3. M68: Globular Cluster Nice glob in Hydra
4. M97: Owl nebula Faint planetary nebula in Ursa Major. Look for M108 galaxy in same field of view
5. Canopus: 2nd brightest star in the sky. Brightest star in the southern constellation Carina, will be low in the south
6. Achird Eta Cassiopeia: is an interesting binary star. The primary is a G2 class exactly like our Sun. The secondary is a red companion.
7. Sirius: The brightest star in the night sky is also a binary. Observing challenge: you'll need excellent seeing and at least a 6" aperture to spot Sirius b

Cosmic Classroom (CC)



The ABCs of Stargazing

How would you describe to a friend the size of a sky object, its distance from a particular star, its brightness, or its location on the celestial dome?

The ABCs of stargazing allow you to do just that!



"A" is for angular size and distance

Be sure to remember these handy references when discussing size or distance in the sky:

- The moon spans $1/2^\circ$. It would take 360 "full moons" to reach from horizon to horizon!
- The apparent width of the tip of your index finger on your extended arm is less than 2° .
- The width of the bowl of the Big Dipper is 5° and the bowl's length is 10° .
- Your clenched fist on your fully extended arm is 10° from side to side.
- Your outstretched hand on your extended arm is 15° from the tip of the pinky to the tip of the thumb.



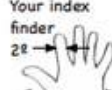
Width of the Full Moon $1/2^\circ$



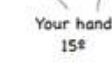
Moon's apparent size relative to your clenched fist



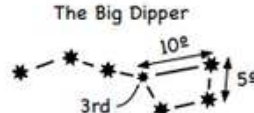
Your fist 10°



Your index finder 2°



Your hand 15°



The Big Dipper

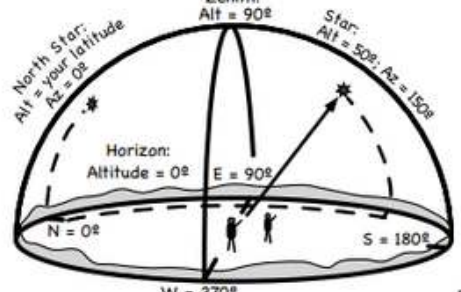
Six of the seven stars of the Big Dipper are of the 2nd magnitude.

"B" is for brightness

Skywatchers use the "magnitude" scale to describe an object's brightness. Don't be confused by the reverse nature of the scale: The brighter the object, the smaller the magnitude. Objects with negative magnitudes are very bright, indeed!

Polaris, the North Star, always has an azimuth of 0° and has an altitude above the northern horizon matching the latitude of the observer.

Mag.	Object
-26	Sun (never look at the sun!)
-12	Full moon
-4	Venus
-2.5	Jupiter at its brightest
-1.5	Sirius, the brightest star in the night
0	Arcturus, Vega, Capella, Saturn
+1	Pollux, Regulus, Altair
+2	Six stars of the Big Dipper, North Star
+6	The faintest star seen by unaided eyes



Zenith: Alt = 90°

North Star: Alt = your latitude, Az = 0°

Star: Alt = 50° , Az = 150°

Horizon: Altitude = 0°

N = 0° , E = 90° , S = 180° , W = 270°

"C" is for coordinates

Stargazers often use the simple, but descriptive altitude-azimuth (alt-az) system to locate objects in the sky.

Azimuth coordinate:	Altitude coordinate:
North is 0°	Horizon is 0°
East is 90°	Zenith is 90°
South is 180°	
West is 270°	

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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!

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.

Additional Information

PAS Sam Insana Student Scholarship winner at Paradise Valley Community College will soon be announced. Your membership fees allow us to do this each year.

Members Only Telescope Loaner Program Status- Richard Sauerbrun

As you are aware, PAS launched a new telescope loaner program last month. Over the years, the organization has been the recipient of many telescopes and accessories that have been generously donated both by our members and the public.

Until recently, most of this equipment was stored in 3-4 long-time PAS member's homes and was basically unused. Late last year, we began gathering this equipment and bringing it to a central storage location. Here, we were able to analyze what we had, make a few minor repairs, and sort the equipment into three groups.

We have disposed of the equipment that was beyond repair and classified as junk. The second group is awaiting a school, scout group, or other organization interested in a donation. The third group is made up of excellent, fully functional telescopes and accessories. It is this group of equipment we are offering as loaners to PAS active members.

To date, the number of requests to borrow equipment has not approached our expectations. Only two of our scopes (the ZWO SeeStar and an 8" Orion Dobsonian), and one set of advanced 2" eyepieces have been checked out.

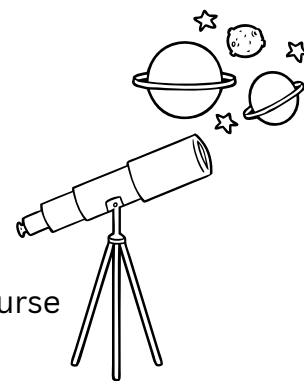
Apparently, we have misjudged the interests and desires of our membership. If this is true, we need to switch gears and find a better way to utilize this equipment. We are, therefore, looking for suggestions ... selling, raffling, gifting? What do you think we should do? Please submit your suggestions to telescope@pasaz.org and let us know.



I Broke It..my telescope

By Stu Brackney

Nothing can ease the pain when you do some damage to your telescope. Somehow, I broke the focus mechanism on my Celestron 8 SE. True. If you cannot focus your scope, why even set it up? So of course I had to fix it. AND they did.



I drove to Tucson with my wife and her sister to www.Starizona.com 5757 N. Oracle Rd. Tel 520-292-5010. We often refer our members and the public to this company as they have a fabulous reputation for repairing and selling scopes.

So, my plan was to drop off the OTA (Optical Tube Assembly), have them diagnose it, and then give me a day when it would be repaired and the cost,

I experienced their reputation for excellent service as they advised me to take my wife and sister-in-law to lunch and come back later, which we did.

My oh my, they fixed a complicated mechanism issue that I somehow broke.

So, this story is to remind you, of course your equipment may still be under warranty, however if not, they are certified Celestron technicians and work on many other brands of equipment. We here at PAS will continue to refer our members to www.Starizona.com for purchase and repair of astronomy equipment. Just thought all of you should know. Besides, a visit to Tucson is always an enjoyable experience.

