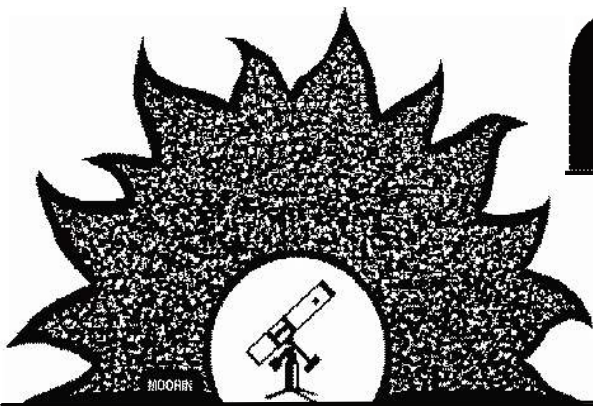




PAStimes

Phoenix Astronomical Society

www.pasaz.org

April 2023

Volume 74 Issue 8

PHOENIX ASTRONOMICAL SOCIETY — ESTABLISHED 1948

MARK JOHNSTON TO SPEAK AT APR 6 MEETING

“My Journey in Astronomy Outreach”

By Mark Johnston, Solar System Ambassador

From showing the Moon to neighbors as a child with a 60mm Tasco telescope, to a NASA Solar System Ambassador and the resident Four Seasons Resort astronomer with over 30,000 social media astronomy followers, I've had an interesting outreach journey. Tonight I'll be describing what I've learned and providing some tips on how you might increase your outreach too.

Since he discovered Saturn at 10 years of age with a backyard telescope, Mark Johnston has been determined to learn as much as he can about astronomy and share it with others. An award-winning astronomy speaker, he has given hundreds of public outreach programs, and many thousands of people have looked through his telescopes to see the wonders of the universe. In addition

to being a Solar System Ambassador, Mark is a member of the Astronomical League, the Phoenix Astronomical Society, the Astronomical Society of the Pacific, and is an accredited cruise ship speaker on Astronomy and Space Exploration topics.

APRIL PAS MEETING

By Terri Finch, Event Manager
Mark Johnston will be doing his presentation in person at PVCC in the Life Sciences building (LS) room 205. The Meeting room door opens at 7pm. President Stu Brackney will open the meeting at 7:30pm and then turn it over to our fantastic Guest Speaker shortly after.

Those of you who wish to attend via Zoom can log in at 7pm to this Zoom link:
<https://us02web.zoom.us/j/81193628193?pwd=NIBZN2IU204VnVySk5SZXhtZWc2UT09>

Mark has a bunch of great FREE items for those who attend in person to take home. You don't want to miss this presentation. Mark has been Wow'ing the public and PAS with his talent, equipment & astronomical skills at Public Outreach. Come join PAS in welcoming Mark to the meeting, and bring a friend!



MARK JOHNSTON IS A SKILLED AND INTERESTING PAS MEMBER. HE IS A SOLAR SYSTEM AMBASSADOR BY DAY AND AN ASTROPHOTOGRAPHER BY EVENING USING EAA TO PRODUCE HIS PHOTOS. YOU DO NOT WANT TO MISS THIS PRESENTATION! PHOTO PROVIDED BY MARK.

TOM KLARE'S ASTROPHOTOGRAPHY

“Photographing Stars with a Digital Camera”

Review by Stu Brackney

This lecture by Professor Tom Klare reminded all of us that we can capture images of the night sky with our digital camera. There is a saying amongst photographers that anyone with a cell phone can take a picture, but photographers “make pictures”, emphasizing that skill and knowledge of specific software are required instead of just a snap of the cell phone button.

Tom took us on a journey with his own photographs showing us the various settings he used on his digital camera for

each picture, enabling the viewer to better understand the impact of these adjustments. He reminded all of us that light is the master when shooting at night. Understanding how to use the night sky light and at the same time add some light sources to his picture resulted in some amazing views of a deserted town in the middle of nowhere. Tom emphasized that shooting in the “raw” format is most beneficial, especially when you return to your home computer to process the images. Software such as Lightroom and Photoshop enable the photographer to adjust the image with amazing results. Tom is an internationally recognized photographer and his inspiring lecture to

SEE “PHOTOGRAPHING STARS” ON PAGE 3.



TOM KLARE WAS THE AMAZING GUEST SPEAKER AT THE MARCH PAS MEETING. IT WAS DONE SOLELY VIA ZOOM FOR REASONS OUT OF PAS'S CONTROL, HOWEVER, IT WORKED OUT FANTASTIC! PHOTO PROVIDED BY TOM KLARE.

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PAST PAS RECORDED PROGRAMS

By Terri Finch, Event Manager

Did you miss a PAS Meeting and wish you could see it? You can get to the link of Past Recorded PAS Meetings with Guest Speakers any time by going to the left hand navigation tool on the PASaz.org website and clicking on "PAS Monthly Meetings." From there a drop down item will appear and please click on "Videos of Speaker Presentations." You will then find recordings of Past PAS Meetings for your viewing pleasure. The collection is in oldest to newest order. Please work your way to the bottom of the collection to find the most recently recorded PAS Guest Speaker Presentation.

As long as PAS can record the PAS Meetings, PAS will continue to add more recordings to this page. Here is the direct link to the recorded PAS Meetings collection: <https://www.pasaz.org/pas-monthly-meetings/videos-of-speaker-presentations>. Enjoy!

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Bold items Listed in TOC are Upcoming Public & Private Events

WHAT'S UP FOR APRIL

Name	Date	Rise	Set
Mercury	04-15-23	06:42	20:30
Venus	04-15-23	07:59	20:12
Mars	04-15-23	10:27	00:68
Jupiter	04-15-23	05:57	18:42
Saturn	04-15-23	03:49	14:52
Uranus	04-15-23	07:07	20:42
Neptune	04-15-23	04:47	16:37
Pluto	04-15-23	02:09	12:06

All Times Arizona Time UT-7

Bold means the object is "visible" in the evening

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 from September to May 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 Don Boyd unless otherwise credited. All articles and photos are copyright their authors or PAStimes.

APRIL 15, 2023

Sunrise: 5:59

Sunset: 19:00

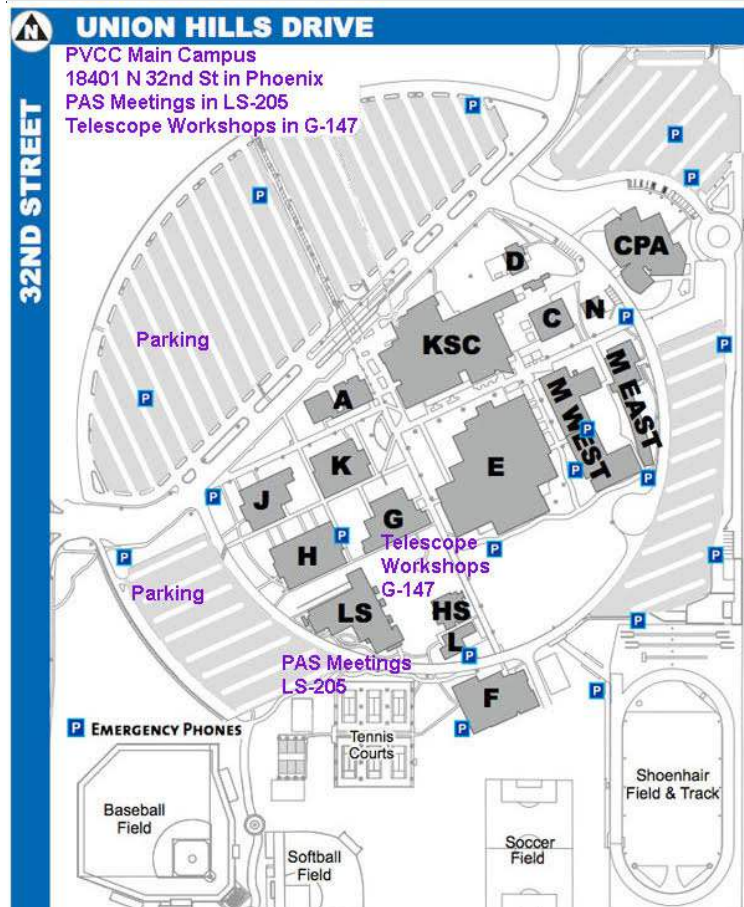
Full: April 5

Q3: April 13

New: April 19

Q1: April 27





2023 PAS GUEST SPEAKERS AT HYBRID MEETINGS

By Terri Finch, Event Manager - Events@pasaz.org

All PAS Meetings with a Guest Speaker held at PVCC can be attended in-person, as well as via Zoom, in a hybrid meeting. Those of you who wish to attend the meeting in person, please meet in LS-205 at PVCC Main Campus (map to the left of this article). If you wish to attend the meeting via Zoom, that option is available. Until further notice, PAS is using the same Zoom Meeting Link for each PAS Meeting: <https://us02web.zoom.us/j/81193628193?pwd=NIBZN2IU204VnVySk5SZXhtZWc2UT09>

Please visit the PAS calendar at www.PASaz.org to find out more about these upcoming meetings and guest speakers. For a complete list of guest speakers visit: <https://docs.google.com/document/d/1OO-UpaYNvw3p7JCRXCKSjDebsK60DnvWOoifbqPrNp8/edit?usp=sharing>

Do you have an idea for a guest speaker? Email the details and contact info for the possible guest speaker to Paul Facuna at VicePresident@pasaz.org.

Here are the next scheduled guest speakers at PAS:

May 4: Tom Sharp “Shock Effects in Meteorites”

Sept 7: Data TBA

Oct 5: Data TBA

Nov 2: Kai Staats - Topic TBA

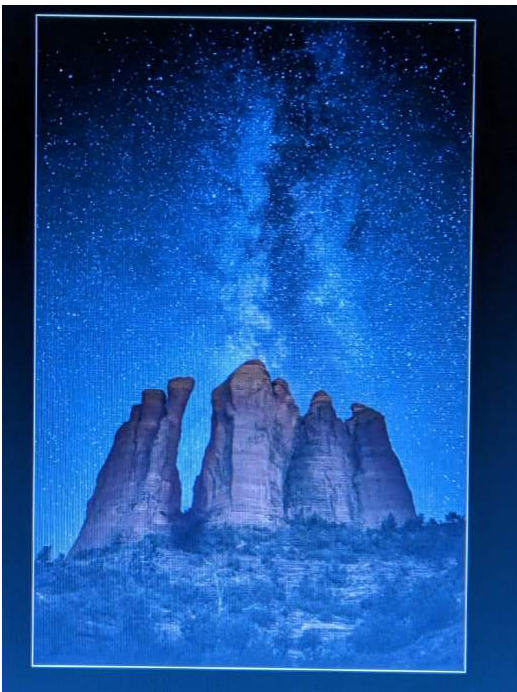
Dec 7: Data TBA

PHOTOGRAPHING STARS

(FROM PAGE 1)

our PAS audience is definitely proof of that.

Tom’s lecture can be found on our www.pasaz.org website under “Monthly Meetings, Videos of Speaker Presentations.”



DURING THE PRESENTATION, TERRI FINCH WAS ABLE TO CAPTURE THIS IMAGE FROM HER COMPUTER SCREEN ONTO HER CELL PHONE OF ONE OF TOM'S FANTASTIC ASTRO PHOTOS.

DON BOYD FOR EDITOR



DON WRITES: I HAVE BEEN EDITOR FOR 17 YEARS, AND I THINK I FINALLY KNOW WHAT I AM DOING.

STU'S VIEWS



President Stu Brackney

APRIL 2023

Hi everyone. The winter nights of March will provide us skygazers lots to see. Our PASTimes newsletter has maps of these skies for your use when you head out for that celestial gazing experience. So, get ready for some fun viewing! This month features three star charts. Enjoy!

Lots to share: Our membership is growing, as we near 100 (yes, one hundred!) you may ask why the growth. Well, we have an active organization with monthly meetings at Paradise Valley Community College that are available simultaneously online via ZOOM. We call those meetings hybrid meetings. We have an active Facebook site, as well as our own website

www.pasaz.org. Reaching out to the public is one of our main missions, plus providing our membership with learning and fun activities, such as the monthly lectures, telescope workshops, social events and hopefully on a regular basis soon, public and private star parties.

We accomplish these events through the hard work of our board members and

Event Manager. In past editions of our newsletter the PASTimes, we have been introducing you to these busy people, which leads me to the next update... Elections.

We hold elections every year in May at our annual meeting, scheduled for May 4th this year.

By the way, we have three manager positions that are appointed by the president. One of those positions, the Event Manager, needs a volunteer. If you are interested, please contact me president@pasaz.org. Our Secretary position is also vacant, so if you are interested in that volunteer position, again contact me.

Finally, you, the members, know what you like and want from an organization, so let me know what you want us to do for you. It's easy... send me your requests and suggestions at president@pasaz.org. Until next time...the stars above you are waiting to fill you with wonder!

CONGRATULATIONS TO PAS

By Terri Finch, Event Manager

One day when I went to the PAS mailbox, I found this lovely letter addressed to PAS % Terri Finch and thought it would be nice to share it with everyone.

Header on page reads: Astronomical Society of the Pacific astrosociety.org, and dated Jan 31, 2023.

By Vivian White and Dave Prosper, NASA Night Sky Network Administrators, nightsky.jpl.nasa.gov

Congratulations to your organization on 50 years dedicated to astronomical observing and outreach! We salute your commitment to both astronomy and your

community. We enjoy hearing about the wonderful events hosted by your group and are honored to partner with your members via participation in the NASA Night Sky Network program. We wish you many more years of partnership in sharing the wonders of the universe to all.

Keep up the wonderful work, and keep looking up!

By Terri Finch, Event Manager

For those of you who don't know, I helped PAS join the Night Sky Network <https://nightsky.jpl.nasa.gov/> back when I first became Event Manager for PAS. What this involves is that every public event PAS holds and a few private events,

are posted to the Night Sky Network website to assist in advertising to the public about our events. Once the event has happened, I then go back into that event listing and update it with an estimate of how many people attended, their demographics, how many kids and adults, what NASA tools were provided at the events, such as the star charts we tend to hand out at every public event, and a few other details. NASA uses this info to find out info about events around the world. It's a very interesting way to work with events. Whoever takes over for me as Event Manager for PAS will be managing this info in my place.

PASTIMES NEWSLETTER PRAISE

By Richard Sauerbrun, PAS Treasurer

Don and Terri: WOW ... another great newsletter!

This one (March 2023 issue) was filled with outstanding content and makes me proud of our organization.

Having access to this publication is well worth the entire price of admission to our organization!

Keep up the excellent work!

By Stu Brackney, PAS President: Richard said it all, it's an awesome publication that makes our society a "stellar" (pun intended) organization.

By Terri Finch: This praise is also for the two fantastic Newsletter Proofers we have on our team: Cheryl White and Alex Vrenios. Without them, I can't imagine the

typos we could have! They really do a fantastic, accurate edit of all the articles and captions. Thank you Cheryl and Alex! Download the March 2023 issue to find out what this praise is about: <https://www.pasaz.org/newsletters>.

A PEEK AT PAS PRIVATE EVENTS

By Terri Finch, Event Manager

PAS Private Events are just that: Private to PAS Members and their immediate family members (living in the same household). So, what's so special about these events? Let's take a look at a few upcoming Private Events because that's the best way for you to find out if joining PAS is a good idea. We think so!

In March & October, PAS hosts an event called the Night Sky Training Session (NSTS). This event is designed to have ONLY PAS members and their immediate family members in attendance. It's a chance for the "seasoned" PAS Member to help the "Newbie" with their telescope, eyepieces, filters, reading & using star charts, & navigating the night sky.

Have you looked at the Night Sky lately? It's so overwhelmingly beautiful, but also there's a lot out there! Where do you start? How do you find your way around the night sky? And even with a star chart, how do you learn to find the objects you want to share with friends or family through your telescope? I have to say it is definitely a learning curve and the more you do it, the better you get at it. But just because you can find a few objects, doesn't mean you know how to find everything. The next NSTS will be on March 18, which is after you get this Newsletter. So, read the review of the event (weather permitting) in the May issue of our newsletter.

Another Private event that PAS Hosts

is the Awards Ceremony. Each year BC (Before Covid) - not during - but now - AC (After Covid) PAS will award for Public Outreach and other activities PAS Members have done throughout the year. And what the award is depends on what has been donated to PAS as well as possibly a Certificate and a pin from the Night Sky Network (these cost PAS a little money but it is worth it for those who deserve an award). At the Awards Ceremony a PAS Member who is super active in public events can earn a pin, possibly a trophy, and prizes for their promotion of Astronomy and PAS. The next Awards Ceremony is scheduled for May 20th. Since we haven't had an Awards Ceremony since BC, we will be giving awards from 2019, 2020, 2021 and 2022, plus any past awards that were not given previously. The Awards Ceremony only happens once a year, usually around the END of the PAS year which is in May.

The third kind of Members Only event PAS hosts is private Star Parties. These can be held in various locations but the idea is that the club members get together to spend time learning from each other, not in a teacher / student set up, but in a goal oriented evening. One of the PAS Members may do astrophotography that night, and those who are interested in knowing how to do it, could ask questions and learn. But it's not a teaching session. It is a chance to get to know your fellow PAS members and enjoy some time observing various things in the night sky.

The difference between a Private Star

Party and a Public Star Party is that at a Public Star Party people line up to your scope and ask, "What are you looking at?" At a Private star party you might mention what you have in your scope and have people come look at it, but you aren't trying to give them a bunch of interesting facts about the object, and repeating over and over what object you are showing. I'd say the Private Star Party is more relaxed. You find what you can, or what you want to find in your scope, then announce "I've got the Crab Nebula." And whoever wants to see it, comes to your telescope to look.

And then there's the Board Meetings. The PAS Board, those members who you have elected to lead & take care of the club. They get together in a private session to chat about the various Business items that need to be addressed in PAS. They work out the details and then bring them to the members at the meetings in announcements, or votes or other forms of communication as to what was decided by the Board of PAS. Those are private meetings and any PAS Member can attend, but you must be a current PAS Member to attend.

All of these Private events are FREE for PAS Members to attend. Plus, they are a chance to learn about your favorite hobby with some other fine PAS Members who wish to know the same thing. In PAS, it's all about sharing what we know and enjoying the activities, and learning sessions, together. I hope you will, if you aren't already, consider joining PAS. We have a lot of fun!!!

APRIL & MAY PAS PUBLIC EVENTS

By Terri Finch, Event Manager

Always be sure to RSVP your attendance for all these events at Events@pasaz.org. They are all FREE to attend & open to the public.

Here are the upcoming Public events:

Apr 6: PAS Meeting with Mark Johnston "My Journey in Astronomy Outreach." This will be a fascinating presentation. You don't want to miss it, either in-person or via Zoom. The link to the Zoom meeting is <https://us02web.zoom.us/j/81193628193?pwd=NIBZN2IU204VnVySk5SZXhtZWc2UT09>. If you wish to attend in person, please join PAS at PVCC Main Campus - 32nd Street & Union Hills in Building LS (Life Sciences) room 205.

Doors open at 7pm for setup & announcements. Guest Speaker begins at about 7:30pm.

Apr 13: Free Telescope Workshop: This is located at PVCC Main Campus in Building G, Room 147. This event is from 7:30pm to 9:30pm and it is the last Telescope Workshop at PVCC until September 2023.

Apr 22: Public Star Party: RSVP is required at Events@pasaz.org to attend. Parking is limited. Once parking is full, no others will be invited. The address of the event is in Carefree & given to you when you RSVP. Potluck at 5:30pm. The Star Party starts at 7:30pm. Everyone is welcome, all ages.

May 4: PAS Meeting with Tom Sharp

"Shock Effects in Meteorites." You don't want to miss it, either in-person or via Zoom. The link to the Zoom meeting is <https://us02web.zoom.us/j/81193628193?pwd=NIBZN2IU204VnVySk5SZXhtZWc2UT09>. If you wish to attend in person, please join PAS at PVCC Main Campus - 32nd Street & Union Hills in Building LS (Life Sciences) room 205. Doors open at 7pm for setup & announcements. Guest Speaker begins at about 7:30pm.

Hope to see you at these upcoming, fun, family friendly and kid friendly PAS events. Find more events at www.pasaz.org.

PAS MAY 2023 ELECTION OF OFFICERS

By Terri Finch, Event Manager

As many of you may already know...PAS is holding its annual Officer Elections via email this year. Starting Feb 27th, PAS Members would have received the "2023 Nomination Form" via email. Nominations for office were accepted until March 6th.

Officers contacted the Nominees and

had them send a brief paragraph of why they wish to have that office, what they can do for PAS, and a photo of themselves in time for the April Newsletter.

On April 19th, the Ballots go out by Email. Please take a look at the Nominees in this issue of PAStimes. Choose your 2023-2024 PAS Officers carefully. Voting ends on April 27th at 6pm, one week

before the May PAS meeting. That gives the Secretary time to tally the results and the new PAS Officers will be announced at the May meeting.

We thank all PAS Members for taking the time to vote in this election. If you have any questions about this process, please email our current President at President@pasaz.org.

STU BRACKNEY FOR PRESIDENT

By STU BRACKNEY, CURRENT PAS PRESIDENT

I am requesting to be your president for another year as I feel we have accomplished so much during my last two years as your president. With my personal ZOOM account, we have responded to COVID by setting up our monthly lecture series meetings. I established a task force that revised the web site allowing everyone to join and renew memberships instead of paper forms and checks. I established a committee to review and update our bylaws. Those recommendations were approved by you. I organized our board members to more effectively address the needs of PAS through monthly board meetings that are accessible to everyone. But there is more to do, such as increase the number of star

parties and PAS social events. Provide more "how to do" events regarding astronomy for our members, and look for a permanent home for our PAS monthly meetings. With your vote and support I truly believe that PAS can continue its rich history of sharing the fun and excitement of astronomy.



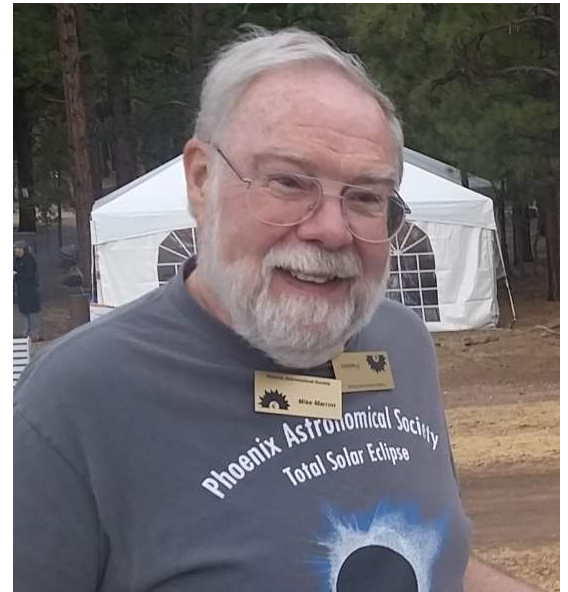
STU BRACKNEY FOR PRESIDENT

MIKE MARRON FOR PRESIDENT

By Mike Marron, Former PAS President

Mike Marron has been an amateur astronomer for 60 years. Back then he helped build and teach astronomy at the James C. Veen Observatory in Lowell Michigan which is still open to the public. A lifetime of astronomical interest has given Mike an encyclopedic understanding of the workings of the universe that he often shares with the public. Most often known as 'that guy with meteorites' listening to Mike's contagious enthusiasm for astronomy, physics, and planetary geology is a quick college level education. Mike's prepared lectures are fire hoses of new and detailed information. Mike has been a longtime PAS member who has opened his home and dark skies to club members and the public. Mike helped the club reacquire their 501c3 status. He led the club in activities such as trips to observatories, museums, gem shows (meteorites),

planetariums, dark sky star parties, lectures, PAS socials, and more. Mike was the longest serving PAS president in history (tied with Kia Staats at 4 years DB Ed.). Vote Mike for president.



MIKE MARRON FOR PRESIDENT OR MEMBER AT LARGE

PAUL FACUNA FOR VICE PRESIDENT

By Paul Facuna, Current VP

I am running for another term as Phoenix Astronomical Society Vice President and request your support. In the past I have arranged for individuals involved in some field of astronomy to give interesting and informative presentations at the PAS monthly meetings and I plan to do the same in the coming year. I was a member of the committee that reviewed and updated the organization's bylaws. I was on another committee that reviewed a special membership category, the results of which still have to be reviewed by the full Board. I will suggest ideas for astronomy activities that will keep members involved

and interested in PAS and help to attract new members. I will work with the Board to address and solve problems and the needs of PAS.



PAUL FACUNA FOR VICE PRESIDENT

RICHARD SAUERBRUN FOR TREASURER

By Richard Sauerbrun, Current PAS Treasurer

I have enjoyed serving on the Society's Board of Directors for the past year and wish to be considered for reelection to next year's term. As an officer of the corporation, I have contributed to the increase in professionalism of how our organization is run, improved the transparency of Board decisions to the membership, and improved our corporate record keeping. And as Treasurer, I have improved our membership records and continued the detailed financial record-keeping of our previous Treasurer. I remain dedicated to the Society's long term growth and success. I will appreciate your vote and support.



RICHARD SAUERBRUN FOR TREASURER

MARK JOHNSTON FOR MEMBER AT LARGE

By Mark Johnston

I'm interested in participating on the PAS Board as a member at large as I feel I have a lot to offer to the club.

Qualifications:

- Astronomy enthusiast for over 50 years
- NASA Solar System Ambassador
- Master of Outreach from the Astronomical League, do an average of 100 outreach events per year
- Official astronomer for Four

Seasons Resort Scottsdale and Pinnacle Peak Park

- Published astrophotographer (Astronomy magazine, Space.com, RASC, BBC Sky at Night, others)
- > 40,000 astronomy followers on Instagram @azastroguy
- Registered cruise ship speaker on astronomy and space science topics



MARK JOHNSTON FOR MEMBER AT LARGE

BRUCE WURST FOR MEMBER AT LARGE

PETE TURNER FOR MEMBER AT LARGE

MIKE MARRON FOR MEMBER AT LARGE



By David Prosper

Have you ever witnessed a total solar eclipse? What about an annular solar eclipse? If not, then you are in luck if you live in North America: the next twelve months will see two solar eclipses darken the skies for observers in the continental United States, Mexico, and Canada!

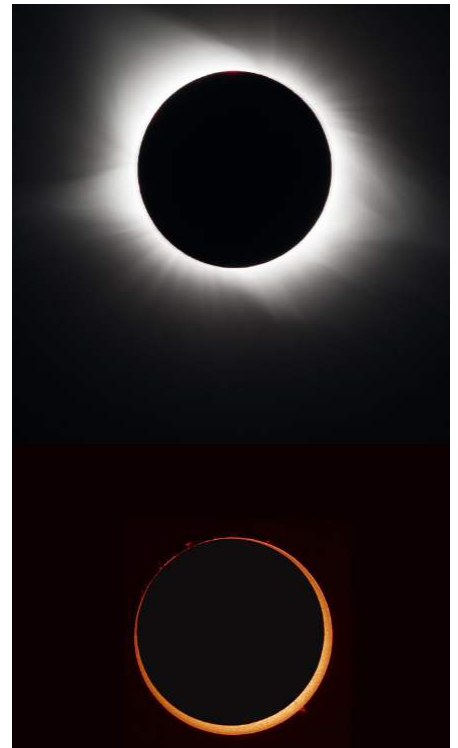
Solar eclipse fans get a chance to witness an annular eclipse this fall. On Saturday, October 14, 2023, the Moon will move exactly in front of the Sun from the point of view of observers along a narrow strip of land stretching across the United States from Oregon to Texas and continuing on to Central and South America. Since the Moon will be at its furthest point in its orbit from Earth at that time (known as apogee), it won't completely block the Sun; instead, a dramatic "ring" effect will be seen as the bright edge of the Sun will be visible around the black silhouette of the Moon. The distinct appearance of this style of eclipse is why it's called an annular eclipse, as annular means ring-like. If you are standing under a tree or behind a screen you will see thousands of ring-like shadows projected everywhere during maximum eclipse, and the light may take on a wan note, but it won't actually get dark outside; it will be similar to the brightness of a cloudy day. This eclipse must only be observed with properly certified eclipse glasses, or other safe observation methods like pinhole

projection or shielded solar telescopes. Even during the peak of the eclipse, the tiny bit of the Sun seen via the "ring" can damage your retinas and even blind you!

Just six months later, a dramatic total solar eclipse will darken the skies from Mexico to northeast Canada, casting its shadow across the USA in a strip approximately 124 miles (200 km) wide, on Monday, April 8, 2024. While protection must be worn to safely observe most of this eclipse, it's not needed to witness totality itself, the brief amount of time when the Moon blocks the entire surface of the Sun from view. And if you try to view totality through your eclipse viewer, you won't actually be able to see anything! The Moon's shadow will dramatically darken the skies into something resembling early evening, confusing animals and delighting human observers. You will even be able to see bright stars and planets - provided you are able to take your eyes off the majesty of the total eclipse! While the darkness and accompanying chilly breeze will be a thrill, the most spectacular observation of all will be the Sun's magnificent corona! Totality is the only time you can observe the corona, which is actually the beautiful outer fringes of the Sun's atmosphere. For observers in the middle of the path, they will get to experience the deepest portion of the eclipse, which will last over four minutes - twice as long as 2017's total solar eclipse over North America.

While some folks may be lucky

enough to witness both eclipses in full – especially the residents of San Antonio, Texas, whose city lies at the crossroads of both paths – everyone off the paths of maximum eclipse can still catch sight of beautiful partial eclipses if the skies are clear. The Eclipse Ambassadors program is recruiting volunteers across the USA to prepare communities off the central paths in advance of this amazing cosmic ballet. Find more information and apply to share the excitement at eclipseambassadors.org. NASA has published a fantastic Solar Eclipse Safety Guide which can help you plan your viewing at bit.ly/nasaclipsesafety. And you can find a large collection of solar eclipse resources, activities, visualizations, photos, and more from NASA at solarsystem.nasa.gov/eclipses



PHOTOS OF AN ANNULAR TOTAL SOLAR ECLIPSE (BOTTOM) AND A TOTAL SOLAR ECLIPSE (TOP).

NOTE THAT THE ANNULAR ECLIPSE IS SHOWN WITH A DARK BACKGROUND, AS IT IS ONLY SAFE TO VIEW WITH PROTECTION – YOU CAN SEE HOW A SMALL PORTION OF THE SUN IS STILL VISIBLE AS THE RING AROUND THE MOON. ON THE RIGHT, YOU CAN SEE THE SUN'S WISPY CORONA, VISIBLE ONLY DURING TOTALITY ITSELF, WHEN THE MOON COMPLETELY – OR TOTALLY - HIDES THE SUN FROM VIEW. A TOTAL SOLAR ECLIPSE IS ONLY SAFE TO VIEW WITHOUT PROTECTION DURING TOTALITY ITSELF; IT IS ABSOLUTELY NECESSARY TO PROTECT YOUR EYES THROUGHOUT THE REST OF THE ECLIPSE!

CREDITS: BOTTOM, ANNULAR ECLIPSE: STEFAN SEIP (OCT 3, 2005). TOP, TOTAL ECLIPSE, NASA/AUBREY GEMIGNANI (AUGUST 21, 2017)



THIS DETAILED SOLAR ECLIPSE MAP SHOWS THE PATHS OF WHERE AND WHEN THE MOON'S SHADOW WILL CROSS THE USA FOR THE UPCOMING 2023 ANNULAR SOLAR ECLIPSE AND 2024 TOTAL SOLAR ECLIPSE, MADE USING DATA COMPILED FROM MULTIPLE NASA MISSIONS. WHERE WILL YOU BE? THIS MAP IS VERY DETAILED, SO IF YOU WOULD LIKE TO DOWNLOAD A LARGER COPY OF THE IMAGE, YOU CAN DO SO AND FIND OUT MORE ABOUT ITS FEATURES AT: [HTTPS://SVS.GSFC.NASA.GOV/5073](https://svs.gsfc.nasa.gov/5073) CREDITS: NASA/SCIENTIFIC VISUALIZATION STUDIO/MICHALA GARRISON; ECLIPSE CALCULATIONS BY ERNIE WRIGHT, NASA GODDARD SPACE FLIGHT CENTER.

TELESCOPE WORKSHOP OF MARCH 9TH

By Terri Finch, Event Manager

Many, many thanks go to my fantastic telescope teachers for this evening's event! I couldn't have done it without the help of Bruce Wurst, Roger Anzini, Damon Finell, Richard Pipkin, Stu Brackney, Mason Klenklen, Calvin Vance, and William Finch.

We had a turnout of eleven of the thirteen students who signed up to attend this class. Since the February 16th telescope workshop got canceled, everyone from that class decided to come for the March 9th class. It was a super full house!

Bruce took the three GPS model telescopes. Those were owned by Randy, David and Yasir. Stu and Richard took the four (2 each) Nexstar Telescopes. Those

were owned by Deb, Krista, Lynn and Alan. We had two StarSense telescopes and Mason helped Patrick. The other StarSense telescope owner didn't show up to the event. We had one Dobsonian owned by Sara and she was helped by Roger. We had Damon helping Dave with his Astromaster and he also assisted Dan with the Red Refractor.

Calvin was going to talk about binoculars but my student, who wanted to know what telescope to purchase, never showed up, so Calvin helped many in the class with various items. William also helped many in the class as needed.

It was a huge success and my plan of grouping together all the similar telescopes and putting them with a teacher worked well. We had seven types of telescopes in this class. So the end result

was eleven students and eight teachers, and it worked out well.

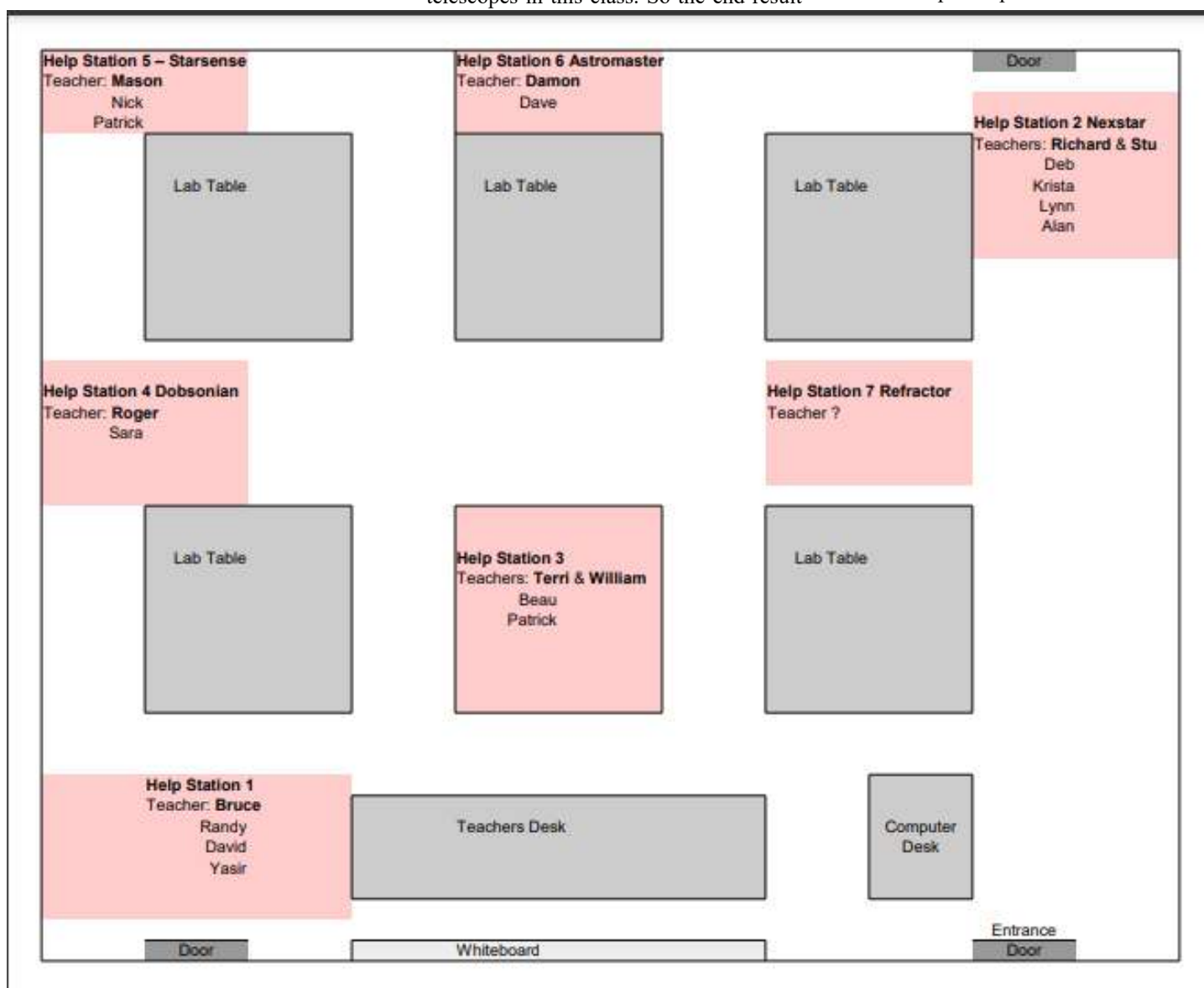
The next Telescopes Workshop will be April 13th. After that, there most likely won't be another telescope workshop until mid-September 2023. Get your RSVP in today to attend at Events@pasaz.org.

By Yasir Batres

Thank you for helping coordinate the telescope workshop last week. My daughters and I saw the M42 nebula for the first time and it was memorable. Everyone was so nice and helpful. Thanks.

By Lynn Gerveler

I want to thank you all for the telescope class. It was wonderful and I am so much more confident with my scope! Stu was super helpful!



AT THIS TELESCOPE WORKSHOP, WE ANTICIPATED 12 TELESCOPES. I DEvised A WAY TO MATCH UP THE 12 TELESCOPES WITH THE 9 TELESCOPE TEACHERS, AND IT WORKED OUT WONDERFULLY. PHOTO IS OF THE PDF PAGE I MADE AND ATTACHED TO THE EMAIL CONFIRMING EACH STUDENT'S ATTENDANCE, AND THE TELESCOPE TEACHERS' ATTENDANCE, AS WELL.

STORY TIME

PROOF OF LIFE



by Alex Vrenios, PhD, PAS Lifetime Member

I've had enough – ignoring the cameras and the questions, I gather my papers and leave the dais. I think about how pleased I am that retirement is only two months away. I have dedicated – some say squandered – my entire career on SETI, the Search for Extraterrestrial Intelligence. “Lack of evidence is not evidence of lack!” I've said that perhaps a hundred times over the years, so many times that I've started to believe it myself. It soon became the single motivating factor for my continued search.

Ever since Frank Drake's famous equation first suggested a way to estimate the probability of life elsewhere in the Universe, people have been willing to dump enormous amounts of time, money, and other resources in support of the search for extraterrestrial life. Failure, the “lack of evidence,” was all too common – the rule, rather than the exception – over the last sixty years.

But success, any evidence of life beyond Earth, could have a global impact. It could be the single most important discovery in history. The scientific, economic, religious, political, and even educational implications would probably extinguish all the petty squabbles that define our daily lives.

Back in 1950, Enrico Fermi once asked, “Where are all the aliens?” Given how relatively young we Earthlings are,

when compared to other potentially inhabitable planets, he mused, it seems reasonable that someone among them must have developed space travel and visited us by now. They don't seem to be here, so where are they? This became known as the Fermi Paradox.

Wikipedia states the Fermi Paradox as “the discrepancy between the lack of conclusive evidence of advanced extraterrestrial life and the apparently high a priori likelihood of its existence, and by extension, of obtaining such evidence.” Whew!

A 2015 article by Dennis Overbye puts it more succinctly: “If life is so easy, someone from somewhere must have come calling by now.”

Not to put too fine a point on it, but “Where are all the aliens?” is the question that started all this SETI business.

And business it was; big business. Some of the SETI-related efforts included Project Orion, the Microwave Observing Project, the High-Resolution Microwave Survey, and Toward Other Planetary Systems. On Columbus Day in 1992, NASA initiated a formal, more intensive, SETI program. Less than a year later, however, Congress canceled funding for the program.

In response to that cancellation, the SETI League, a membership-supported, not-for-profit organization with 1,500 members in 62 countries, began operating in 1994.

So, with all of these smart people considering the existence of extraterrestrial life, and all that money bearing no results, there wasn't a single reason to believe that I might actually discover alien life.

But what if I did...

Professor William Jankowski, Bill, my dissertation committee chairman, grew up with Grote Reber back in Illinois, the ham operator who designed and built the first radio telescope. He was first to map the radio sky, and subsequently became known as the first radio astronomer! He built his dish antenna in

his backyard (much to the delight of his neighbors, I'm sure), with his own funds during the economic turmoil of the Great Depression. I met him once when he visited the university, but Bill actually knew him.

Bill learned a lot from Reber and became somewhat of a radio telescope expert in his own right. He built this whole Radio Astronomy department and designed all its programs. The big dish antenna and its accompanying library and laboratory complex was named for him after he died, about three years into his retirement. That all fell into my hands, as I was one of the few people Bill ever confided in. The university was happy that I was putting it all to good use. My personal knowledge of the hardware and software was leverage enough to keep the bean counters off my back about “all that SETI stuff” I was doing. About three years ago, however, I decided that it was high time I started grooming my replacement. Dr. Elenore Fletcher, Ellie, was a bright young girl who recently graduated from here with a Ph.D. in astronomy and astrophysics. She was just finishing a postdoc at Harvard. I sent her an email, reminded her who I was, and asked about her plans after she left Harvard, assuming she was leaving, of course. She wrote back saying Harvard turned pretty cool towards her once she began suggesting they start a SETI program. Well, well...

Ellie was a hard worker and a quick study. I gave her tasks of increasing complexity and she breezed right through them. She knew what she was looking for long before she got here. It was “how to look for it” that I supplied. It took only a couple of years for her to pretty much run the place on her own. But all that's in the past now, and still no indication of life beyond our solar system.

We got excited about an incoming signal a few years back. We called Goldstone in California and they confirmed it. We called Jodrell Bank in England, but they could not confirm, saying it was just below their horizon. When we called the US Military, they told us it was from the test of a highly classified communications satellite. And the champagne went back in the fridge - good times.

This is my last day and it's getting late. I slipped on my jacket and picked up

the banker's box. I glanced down and thought, "Thirty-three years and it all fits into one little box."

I was headed for the stairs when I heard a faint but regular signal on the speakers. I stopped dead in my tracks, turned my head a little, and just listened. Ellie was dialing the phone, calling all the right people. So far, there was no indication in her voice that this signal

could be explained away. She called out to me, "You might want to stick around for a while." Cautious optimism; I taught her well.

With the morning light came the press, the military, and, of course, the university brass. Ellie made the presentation. I sat and listened to her lay out what we knew so far, in a professional and almost deadpan manner. How can she

keep from bursting at the seams, I wondered?

I knew that this was a career-maker. Ellie would forever be linked to that "first contact," and I had no right to play even a small part in it, except maybe to wish her the best of luck in the coming months. She will need it.

SONORAN TRAILS MIDDLE SCHOOL STAR PARTY MAR 2ND

By Mason Klenklen, Star Tours Member

Sonoran Trails Middle School Science Night was an exciting evening of learning and exploration, with students from different grade levels eager to engage with various booths, including the Star Tours team. As a member of the team, I set up my telescope in anticipation of the event. Just as I was setting up, the clouds started to roll in, but fortunately, they cleared up just in time to take a few pictures of the moon.

The students were given a "passport" with a page for each booth, and each page had assignments to encourage them to ask questions and engage with each booth to earn a stamp. At my booth, I invited the students to look through the telescope and also showed them a photo of the Orion Nebula on my laptop. At Mike's booth the students could feel real meteorites and learn about the evidence an impact can leave on terrestrial rocks. We were delighted to see the students eagerly seeking two interesting astronomy facts, asking questions, and engaging with us.

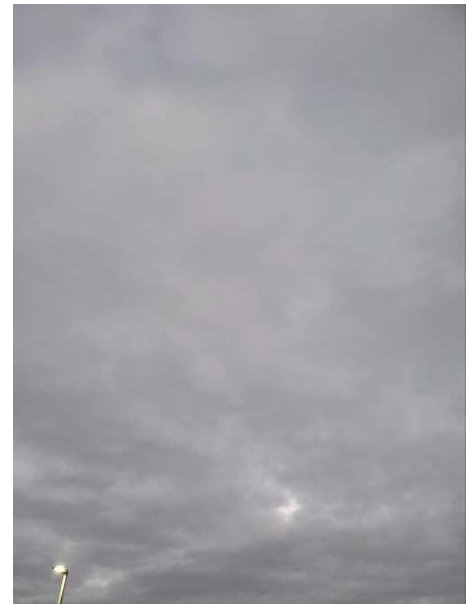
During the event, I shared several fascinating facts about astronomy with the students, such as the shadows visible in the craters along the terminator, the lower density of craters in the maria compared to the highlands indicating past geologic activity on the moon. I also talked about the Orion Nebula, explaining how it is a stellar nursery where new stars are born. The students were eager to learn more and asked thoughtful questions, making for a truly enjoyable and educational experience for everyone involved. One student knew the name of a recently discovered exoplanet, and another asked me about the phase of the moon (Waxing Gibbous). After answering their

questions, the students politely asked for a stamp, and it was clear that they were enjoying themselves. It was a pleasure to share my passion for astronomy with such an engaged group.

Despite the clouds causing a bit of disappointment (Jupiter and Venus were hidden by clouds!), the event was a success overall. While some groups were unlucky with their timing and missed the chance to see the moon through the telescope, others were able to catch a small patch of clear sky. Regardless, it was clear that everyone had a great time exploring the various booths and activities. I'm grateful to have had the opportunity to participate in this special event and to inspire the next generation of astronomers.



AS ONE OF THE MANY BOOTHS THE SCHOOL KIDS VISITED, MASON'S WAS GIVEN THIS RUBBER STAMP TO PROVIDE A CONFIRMATION OF HAVING VISITED MASON'S STATION AND EARNED THE STAMP. PHOTO BY MASON.

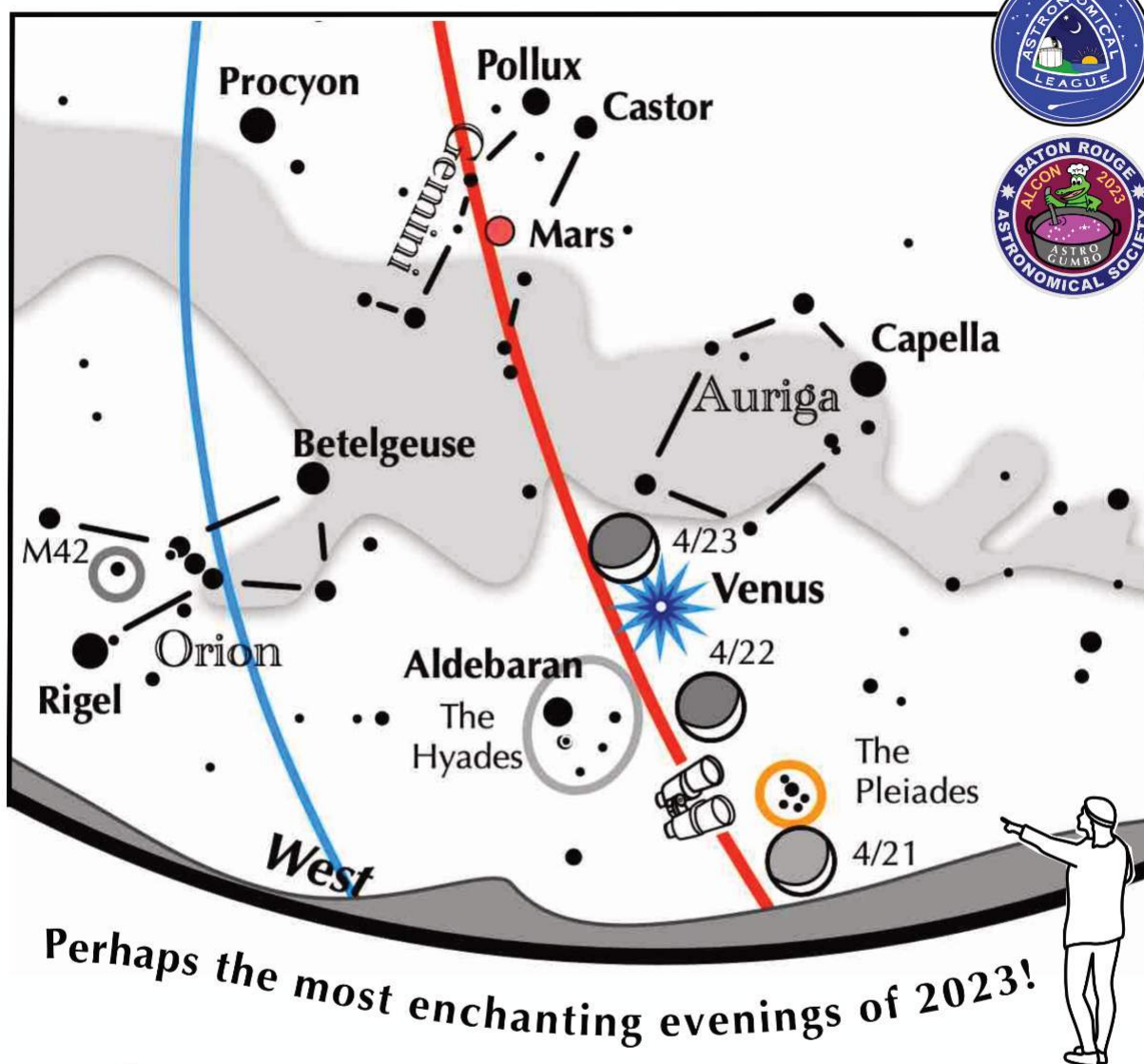


THIS IMAGE IS WHAT MOST OF THE NIGHT WAS LIKE WITH THE MOON HIDING IN THE BOTTOM MIDDLE AREA ON THIS PHOTO. PHOTO BY MASON KLENKLEN.

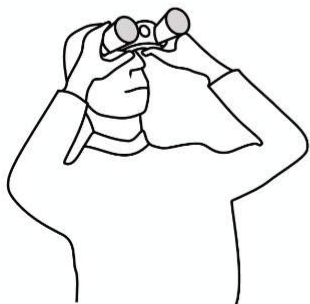


AT THE SONORAN TRAILS SCHOOL EVENT, MASON WAS ABLE TO CAPTURE THIS IMAGE OF THE MOON THROUGH HIS TELESCOPE BEFORE THE CLOUDS TOOK IT AWAY.

If you can see only one celestial event this April, see this one.



Perhaps the most enchanting evenings of 2023!



**Enhance the scene –
use binoculars!**

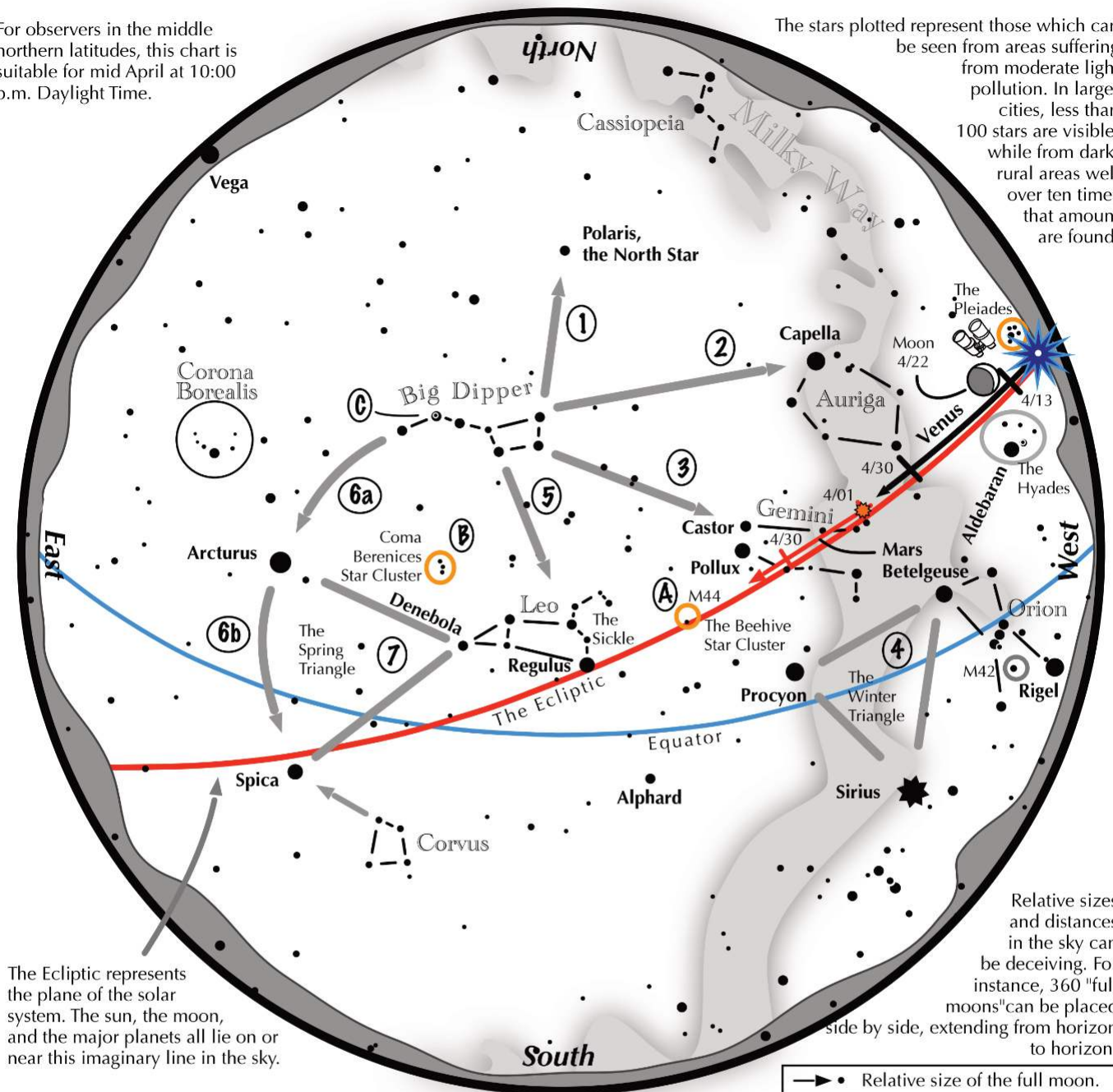
On April 21, 22, and 23, look low in the west-northwest 60 minutes after sunset.

- The crescent moon, glowing full with earthshine, floats just above the horizon in the bright twilight on April 21. Above it, lies the pretty Pleiades star cluster.
- On April 22, the slightly thicker, but more pronounced crescent moon moves between brilliant Venus and the Pleiades, and right of the Hyades star cluster.
- On the third night, the crescent moon stands commandingly above the scene.

Navigating the April Night Sky, Northern Hemisphere

For observers in the middle northern latitudes, this chart is suitable for mid April at 10:00 p.m. Daylight Time.

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.



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

- 1 Extend an imaginary line north from the two stars at the tip of the Big Dipper's bowl. It passes Polaris, the North Star.
- 2 Draw another imaginary line west across the top two stars of the Dipper's bowl. It strikes Capella low in the northwest.
- 3 Through the two diagonal stars of the Dipper's bowl, draw a line pointing to the twin stars of Castor and Pollux in Gemini.
- 4 Look in the west-southwest for the bright Winter Triangle stars of Sirius, Procyon, and Betelgeuse.
- 5 Directly below the Dipper's bowl reclines the constellation Leo with its primary star, Regulus.
- 6 Follow the arc of the Dipper's handle. It first intersects Arcturus, then continues to Spica.
- 7 Arcturus, Spica, and Denebola form the Spring Triangle, a large equilateral triangle.

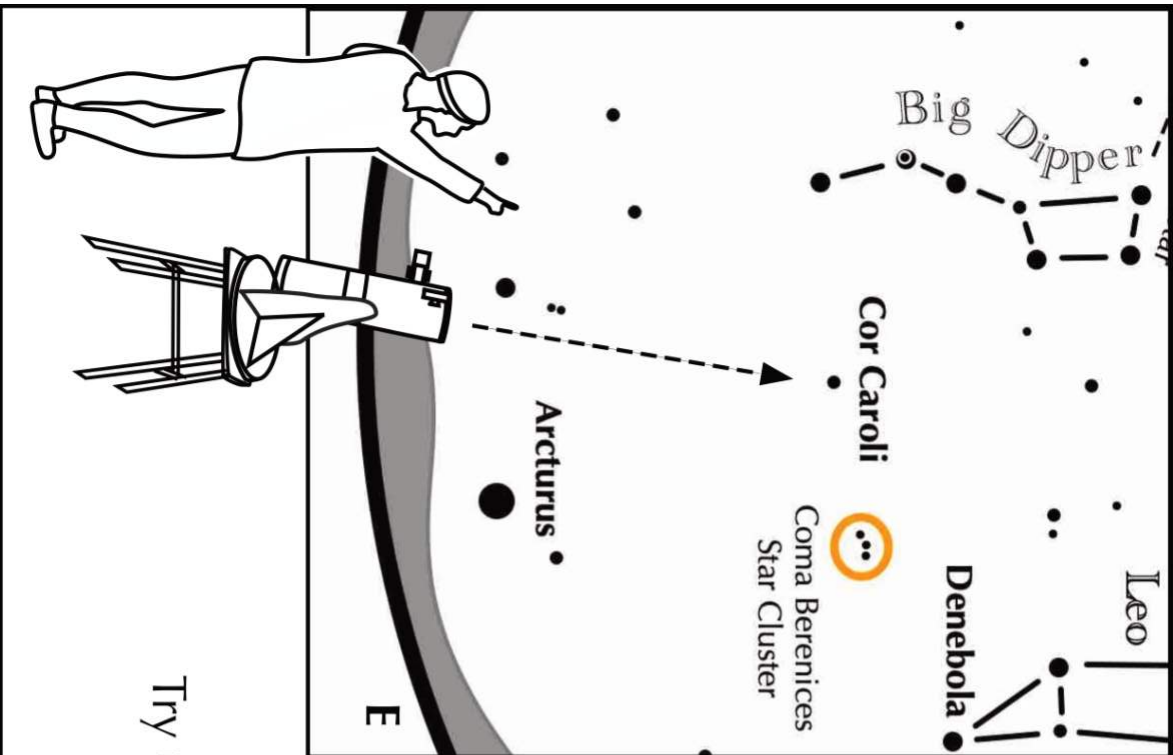
Binocular Highlights

- A:** M44, a star cluster barely visible to the naked eye, lies to the southeast of Pollux.
B: Look nearly overhead for the loose star cluster of Coma Berenices.
C: In the Big Dipper's handle shines Mizar next to a dimmer star, Alcor.

Duplication allowed and encouraged for all free distribution.



Astronomical League
www.astroleague.org/outreach



Other Suns: Cor Caroli

How to find Cor Caroli on an April evening

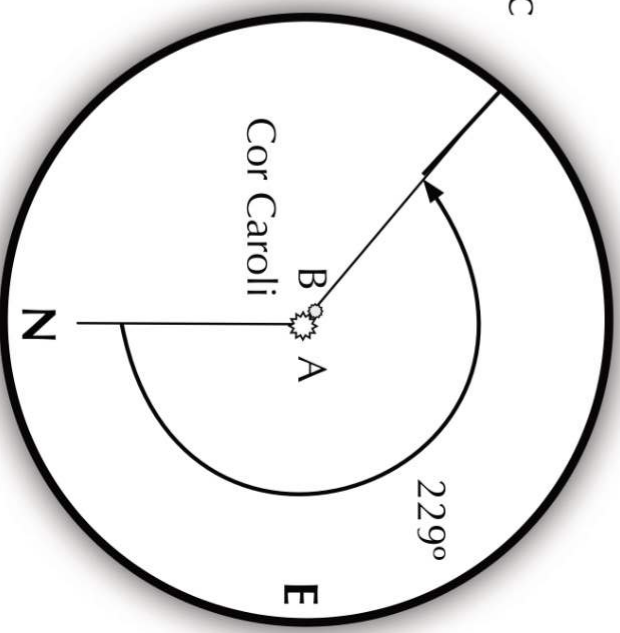
Look northeast toward the Big Dipper. A star, slightly dimmer than the handle stars, is placed near the center of the handle's curvature. That is Cor Caroli.

Suggested magnification: >20x
Suggested aperture: >2 inches

Cor Caroli

A-B separation: 19 sec
A magnitude: 2.9
B magnitude: 5.5
Position Angle: 229°
A color: white
B color: pale blue

Try using steadily held and sharply focused 10x50 binoculars.

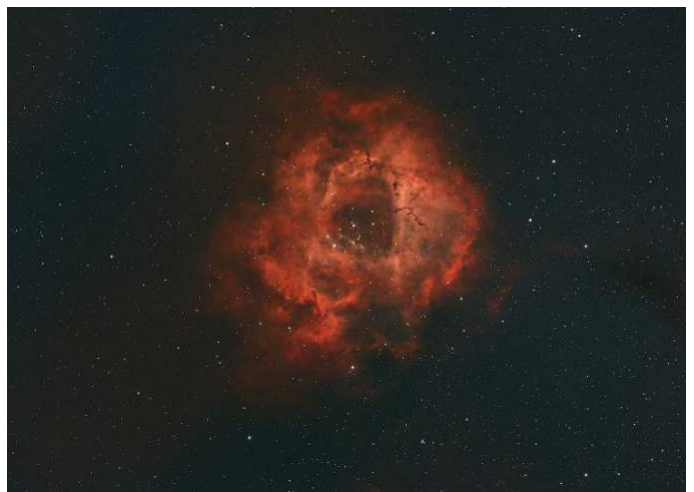




The Milky Way Core season returns! By Carla Meeske, PAS Member: I missed the March 1 PAS meeting - I was out shooting this image. This is Bartlett Lake, shot with the following on Mar 1 2023: Sony a74 Astro Modified (allows for hAlpha nebulosity), Sony 25mm F1.4, Benro Polaris star tracker, Sky 6 images panorama @ 60 sec/F2.2/ISO 640, Ground 6 images @ 90 sec/F2.2/ISO 640, Cropped to approximately 4 images wide, Stitched in PTGui. Developed in Adobe Camera Raw, Photoshop and NIK Color 5. Yes, this is a meteor, not a satellite. I know because I saw it with my own two eyes! And I was delighted it was in the camera field of view. Carla Meeske: milkynight.com



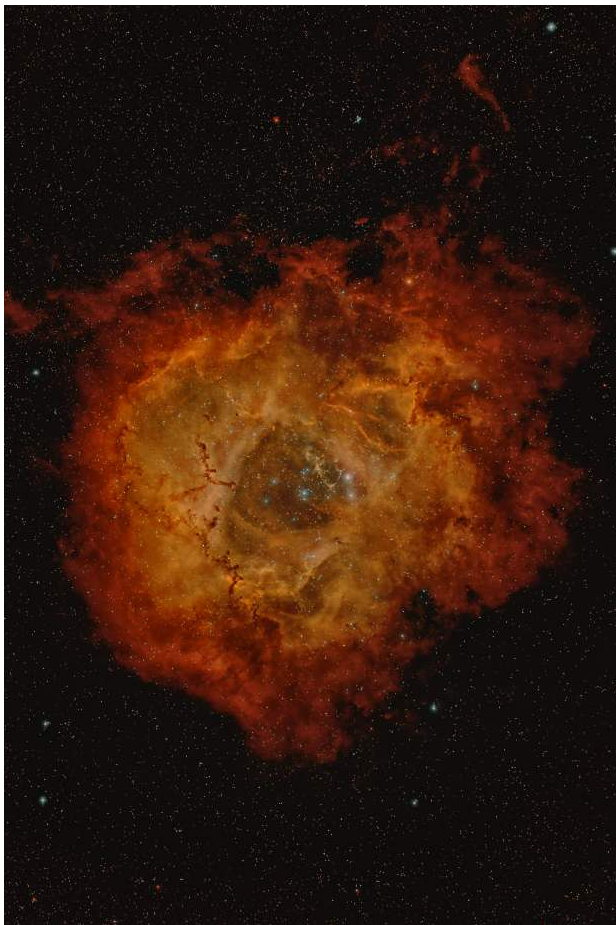
NGC1499 – California Nebula by Richard Sauerbrun: 2 hours of total integration time, captured from my Bortle 8 Scottsdale backyard, William Optics RedCat 51, Sky Watcher GTi mount, ZWO ASI294MC-Pro, OptoLong L-Pro filter, and Pre and Post Processing in PixInsight. Image was taken with an astronomy camera connected to the back of the telescope in November 2022.



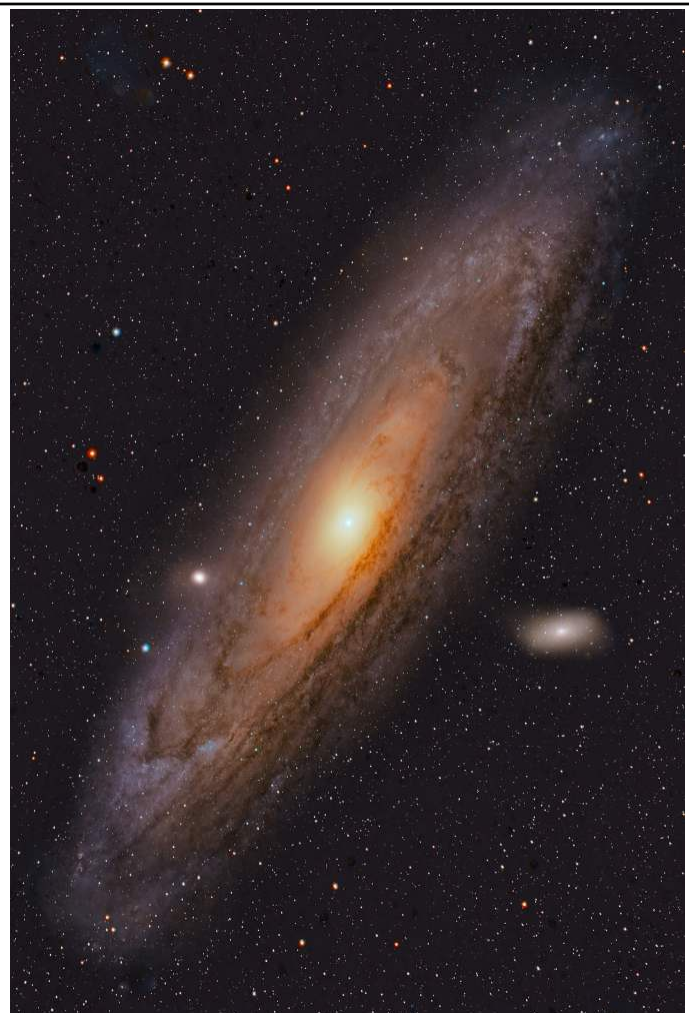
This is SH2-275 – Rosette Nebula. Richard Sauerbrun provided this exciting image for our club newsletter as follows: 3 hours of total integration time, captured from my Bortle 8 Scottsdale backyard, William Optics RedCat 51, Sky Watcher GTi mount, ZWO ASI294MC-Pro, OptoLong L-Pro filter, and Pre and Post Processing in PixInsight. Image was captured with an astronomy camera connected to the back of the telescope in November 2022.



March 7, 2023 Full Moon with TEC160FL from Scottsdale. Taken by Mark Johnston.



Rosette nebula with Celestron C9.25/Hyperstar from the Antennas site. Taken by Mark Johnston on Feb 11, 2023. The Rosette Nebula (also known as Caldwell 49) is an H II region located near one end of a giant molecular cloud in the Monoceros region of the Milky Way Galaxy. The nebula is at a distance of 5,000 light-years from Earth and measures roughly 130 light years in diameter.



M31 with Lunt 100MT from the Antennas site. Photo by Mark Johnston taken on Feb 17, 2023. The Andromeda Galaxy has been visible to the naked eye, given dark skies, throughout history; as such, it cannot be said to have been "discovered" by any one individual. Around the year 964, the Persian astronomer Abd al-Rahman al-Sufi was the first to formally describe the Andromeda Galaxy. He referred to it in his Book of Fixed Stars as a "nebulous smear" or "small cloud."



At Greyhawk school, Mark Johnston did an event and the attendees were given the NASA lithographs shown in this photo. Mark is on the left, and photo is provided by Mark. Event was on Feb 15 2023. Mark writes: On Feb 15th I did two star parties for Grayhawk Elementary school. I showed M42, M31, NGC457, NGC2244, the Double Cluster, Jupiter and Mars. The kids really enjoyed it.

ASTROPHOTOGRAPHY FROM A DARK SKY SITE

By Mark Johnston, Solar System Ambassador and PAS Member

On Feb 18th Kris Mlak and I went out to the Antennas for a night of astrophotography. I got decent images of M31, M81, M82, and Omega Centauri. Gotta take advantage of those rare clear nights! Seems this winter has been nothing but clouds.



NGC5139 Omega Centauri is a globular cluster in the constellation of Centaurus that was first identified as a non-stellar object by Edmond Halley in 1677. Located at a distance of 17,090 light-years, it is the largest-known globular cluster in the Milky Way at a diameter of roughly 150 light-years. Photo by Mark Johnston.



These two galaxies are far far away, 12 million light-years distant toward the northern constellation of the Great Bear. On the left, with grand spiral arms and bright yellow core is spiral galaxy M81, some 100,000 light-years across. On the right marked by red gas and dust clouds, is irregular galaxy M82. The pair have been locked in gravitational combat for a billion years. Gravity from each galaxy has profoundly affected the other during a series of cosmic close encounters. Their last go-round lasted about 100 million years and likely raised density waves rippling around M81, resulting in the richness of M81's spiral arms. M82 was left with violent star forming regions and colliding gas clouds so energetic the galaxy glows in X-rays. In the next few billion years, their continuing gravitational encounters will result in a merger, and a single galaxy will remain. Data Borrowed from <https://science.nasa.gov/galaxy-wars-m81-and-m82>. Photo by Mark Johnston.

NOMINATION OF DAN HEIM AS HONORARY PAS MEMBER

By Dan Heim

My first look through a telescope was around age 5. My "mad scientist" uncle who lived next door, built his own 6" reflector, and ground his own mirror. During his "first light" testing he held me up to the eyepiece to look at the Moon. It was the first time I ever saw the Moon with any amount of magnification. From that point on, I like to say I was "hooked on photonics" :)

I got my first scope (cheap 2" department store refractor) at age 8. My first "real" scope (age 24) was a 6" pedestal mount Criterion. I sold that and bought a 17" Coulter Dob in 1984 to better see Halley's Comet. I sold that and bought a 5" Takahashi refractor just in time for the perihelic Mars opposition of 2003. I am still using that scope to this day.

PAS (Phoenix Astronomical Society)

was running ads in the paper when I moved to Phoenix. This was pretty much pre-internet, so that's how they attracted new members. SAC (Saguaro Astronomy Club) was doing ads too, but PAS was closer. The ad said "just show up" for this observing event and gave the address of Keith Parizek (who was PAS Treasurer for many years) who then lived in North Phoenix. I showed up and was directed to the back yard. There, I saw several telescopes set up, as well as Keith's domed observatory. That was when I knew I wanted to be a member of PAS. I joined that night. It was 1980.



DAN HEIM FOR HONORARY MEMBER OF PAS! PHOTO BY TERRI FINCH AT THE MAY 5, 2016 PAS MEETING.

Some History of Dan's Involvement in PAS

Provided by Dan Heim & Edited by Terri Finch

Dan left PAS to start DFAC (Desert Foothills Astronomy Club) in 2006. He was Facilities Director at Brophy for PAS meetings up to 2006 (PAS originally met at Phoenix College). He started the PAS Club Library while he was at Brophy College Prep. He spent time sifting through boxes of PAS papers and records after the club president, Mark was removed from office. He cleaned up years of clutter that accumulated in the PAS collection.

Dan was involved in many different ways with the PAS club Newsletter. Dan was elected editor at the May 2005 meeting and served as editor from September of 2005 until September of 2006. He redesigned the newsletter logo to include Harold Moorin's scope+sun contest winning design (current logo in

the PAS Newsletter on page 1). He wrote the column "Space for Thoughts" for several years which was in the PAS newsletter.

Website for PAS: Dan redesigned the PAS website to bring it more in line with modern standards, reducing page load time and improving SEO.

He hosted both observing events (Star Parties) and PAS Socials (the once a year social gathering which started as just a Dart Board Game and grew to the Game collection it was before Covid) at Heimhenge (Dan's home in New River) back in the 90's.

Helped PAS have Meeting Rooms for no charge: After leaving Brophy he secured a new no-charge meeting place at Valley Academy Charter School for the PAS Meetings. Around that time, PAS switched to meeting at PVCC (Paradise Valley Community College). He left PAS to start DFAC. DFAC ran for 10 years and went defunct around the start of the

pandemic (2019-2020) due to member attrition.

Recent Donation to PAS:

Dan Heim recently donated a Galactic Gavel to PAS for use by the current President of PAS. You can read about the Galactic Gavel in February 2023 PAStimes Newsletter on page 10 (<https://www.pasaz.org/newsletters>) and the 'Rest of the Story' in the March 2023 issue of PAStimes on page 7. Enjoy!

Dan writes: I am now enjoying my "full" retirement, and still observing on my own. I continue to write my weekly blog "Sky Lights" <https://sky-lights.org/>.

At the April 4th PAS Meeting, Attendees who are PAS Members will be asked to vote on awarding Dan Heim an Honorary Membership in PAS. Please attend the meeting and put in your vote. This vote will happen just before the guest speaker starts his presentation at 7:30pm.

HORSEHEAD NEBULA MARCH 12TH

Imaged by Richard Sauerbrun

By Richard Sauerbrun

Here is a quick image from last night at Apache Wash Trailhead ... This is the image I was displaying on my iPad as they were being taken ... a live view as the images were collected for all to see.

This final image is the result of stacking the last 30 60s images (30 minutes total integration) ... normally far too little time, but this shows how good this site is both for visual and astrophotography. I also cleaned up the image a little in PixInsight (post processing)

Image was taken at Apache Wash Trailhead site (possibly new Dark Sky Star Party site for PAS), data was collected during a small PAS star party to test the site, Images were visible LIVE as they were shot so all that attended could see, Used my RedCat 51 on a Skywatcher GTi mount, ZWO ASI294MC Pro camera from which a total of 30 60s exposures @ 120 gain through a OptoLong L-Pro light pollution filter. Imaging sequence was controlled by ASIAIR Plus and the final image processed in PixInsight.

The way I had my gear set up that evening, it was just like a normal

star party with only a few exceptions ... * I am at the rig to explain the equipment components and answer questions, * I had my iPad on a stand so all could see the images as they came in on the screen and I also have the ability to show the image on a large monitor or TV screen if desired (bigger crowds), * This is NOT just looking at pictures ... you are seeing the live image as they are being taken and So

rather than looking through an eyepiece, you are looking through the camera, * With EAA it is possible to observe far more distant and faint objects, * It is also possible for more people to enjoy the experience at once, * And your equipment is safer as observers do not touch the scope as they look through the eyepiece. * In fact, you can have a large space between the monitor/TV and the actual telescope.



HORSEHEAD NEBULA & FLAME NEBULA MAGED BY RICHARD SAUERBRUN.