



PAStimes

Phoenix Astronomical Society

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PHOENIX ASTRONOMICAL SOCIETY — ESTABLISHED 1948

Mark Johnston to Speak at January 17, 2019

Mark Johnston is a NASA Solar System Ambassador, accredited cruise ship speaker on space and astronomy topics, and presents outreach astronomy programs in Scottsdale, where he has been recognized by the mayor of Scottsdale. Mark's talk is entitled "What We Know About Exoplanets". He will be describing the eight ways we can find exoplanets, how they are classified, and the latest information on missions to find these elusive and fascinating objects.

Join PAS in welcoming this fantastic guest speaker to the January meeting. Everyone is welcome, bring a snack to share, and bottled water will be provided by PAS Member at Large, Bruce Wurst.

Doors open around 7:00pm for a half hour of socializing and set up of the guest speaker, then the meeting begins at 7:30pm. After a few brief announcements about the PAS Annual Swap Meet, Mark will take the floor.

PAS is having a "Meet and Greet the Guest Speaker" dinner prior to the meeting at 4:30pm and to attend, you must RSVP by the day before. Dinner will be at Chili's at 7th Street and Bell Road in Phoenix and it's a buy-your-own dinner. Here's the link to RSVP:

<http://www.pasaz.org/forums/calendar.php?do=getinfo&e=2793&day=2019-1-17>.



Mark Johnston, a PAS Member who recently became a Solar System Ambassador.

December 6, 2018 PAS Meeting

By Terri, Event Manager

Prior to the meeting, a delightful dinner with twelve in attendance was held at Chili's on 7th Street and Bell Road.

We had a wonderful meeting on this night. Our fantastic guest speaker was entertaining, informative and kept the info flowing. I especially enjoyed the meeting as I have a great interest in the Solar System - planets, moons and other objects.

The meeting opened at 7:32pm with a few brief announcements, then Vincenzo shared his vast knowledge of volcanoes on the Planets and Moons from 7:38pm to about 9:08pm, when Enzo opened up the floor to fifteen minutes of Q&A. There were some really great questions, answers and data shared.

We held the raffle and our guest speaker won the main raffle, but he very kindly

provided a really nice collection of posters for the rest of the raffle, so for about ten minutes longer, we raffled off about fifteen posters to the attendees.

I wish to thank Enzo for the fantastic presentation. Many attendees asked if we could get Enzo to return to do another presentation. I also wish to welcome new members Charlie and Natasha Furry who recently moved to Phoenix from Sedona and wish to become very active in PAS.

I also wish to thank all those members who renewed their membership at this meeting for another year with PAS - 2019!!!

I'm looking forward to seeing all of you in the new year, starting with the next PAS meeting which falls on January 17, 2019 in room LS-203. We will see you there!



Enzo Cataldo provided a very informative look at Volcanoes in our Solar System at the December PAS Meeting.

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PAS Upcoming January Events

By Terri Finch, Event Manager

Happy New Year 2019!!!

Check out these and other fun events on the PAS Calendar: <http://www.pasaz.org/forums/calendar.php>. RSVP where requested to Events@pasaz.org. On the PAS Calendar, "Private" means the event is for PAS members only. If you wish to become a PAS member and attend the private events, please download a membership form here: <http://www.pasaz.org/forums/downloads.php?do=file&id=129>

Jan 6: Free Telescope Workshop at Bookmans from 3:30pm to 5:30pm. Bookmans is at 19th Ave & Northern in Phoenix. RSVP required with Terri. More details at this link: <http://www.pasaz.org/forums/calendar.php?do=getinfo&e=2734&day=2019-1-6&c=1>

Jan 12: Sidewalk Astronomy Event at Bookmans: 19th Ave & Northern Ave in Phoenix from 7pm to 10pm. It's a Public

Star Party, everyone welcome! RSVP highly suggested. More details: <http://www.pasaz.org/forums/calendar.php?do=getinfo&e=2665&day=2019-1-12&c=1>

Jan 16: PAS Member Mark Johnston is giving a lecture at the Mustang Library on Jan 16th at 6:30PM on "Is There Intelligent Life Beyond the Earth?" If you're interested you can get more info here: <https://scottsdale.libnet.info/event/879678>

Jan 17: PAS Meeting at PVCC Main Campus in LS-203 at 7pm. More details: <http://www.pasaz.org/forums/calendar.php?do=getinfo&e=2727&day=2019-1-17&c=1>

Jan 23: School Star Party (Private)

Jan 24: FREE Telescope Workshop at PVCC Main Campus 7pm to 10pm in G-147. Bring your telescope and accessories. This is an indoor/outdoor event (weather permitting) and RSVP is required with Terri. No public RSVP's could cancel this

event. More details are here: <http://www.pasaz.org/forums/calendar.php?do=getinfo&e=2730&day=2019-1-24&c=1>

Jan 25: School Star Party (Private)

Jan 26: Public Star Party at Tonto National Monument. Star Party is open to everyone. More details: <http://www.pasaz.org/forums/calendar.php?do=getinfo&e=2713&day=2019-1-26&c=1>

Jan 31: Huge Public Star Party at Black Mountain Campus of PVCC from 6:30pm to 9:45pm. More details: <http://www.pasaz.org/forums/calendar.php?do=getinfo&e=2715&day=2019-1-31&c=1>

At the time of completion of this issue, several more events were in the planning stages and could not be listed as "Scheduled" until they are definitely happening. Please see our online calendar for the events that didn't make it into this list.

PAS Annual Swap Meet on January 17, 2019

By Terri, Event Manager

Plan ahead. Find those unused, unwanted, astronomy equipment items and bring them to the PAS Annual Swap Meet being held this year on January 17, 2019 during the January PAS Meeting.

The Swap Meet will be organized as follows:

- The Left side of the room is Garage Sale format. If you are bringing items to be in the Garage Sale, put your name and asking price on each item and put them along the left wall

as you walk into classroom LS-203. Interested buyers can get with you and you can negotiate the sale. Sales can happen all through the night, and the first to grab a great deal gets it.

- The Right side of the room will be for the Silent Auction. Bring one piece of paper (or use my collection of scrap paper, pencils and pens) with the item listed at the top and all the accessories that come with it and an opening bid. Bidders place their name or initials and bid on the paper, and the

highest bidder at the close of the auction purchases the item. Bids will be accepted until the guest speaker finishes his presentation. All sales and purchases should be completed by 9:45pm so the room can be cleared by 10:00pm.

I wish everyone the best of luck and lots of fun selling and buying at the Swap Meet this year. Let's clean out our closets and make a little extra cash to spend on new equipment, and make our favorite hobby the best it can be!!!

ASU West Star Party October 10, 2018

By Terri, Event Manager

The afternoon started with a nice dinner at Arby's. In attendance was Paul Schmidtke, Mike Marron, Ofelia Waters, plus William and Terri Finch. We had a nice meal and some great conversation.

It was a wonderful evening at ASU West. The temperature was comfortable and there was a slight breeze during the event. The skies had clouds on the horizon to start the event at 7:00pm, but they soon disappeared and then came back around the end of the event at 9:00pm.

An additional PAS member at the star party but not at dinner was Ray Adams. In total, we had two telescopes (Ray and Paul) and the PAS Table which had William and Terri using green lasers to show the night sky, manage handouts, tell people about the October 11 event at BMC, and more. And then we had Mike and Ofelia talking about meteorites at their table.

The sky was very nice for viewing the moon, which set shortly after the event began, Jupiter, Saturn, Mars, Albireo, and a bunch of other objects. Ray had shared with the Telescope Team and Paul, the awesome astrophotos he had taken the night before at his home through his scope, and so that

became something to show the public and I sent many people over to see his great pictures.

We were busy with visitors from about 6:45pm to 9:20pm. An estimated count of about one hundred twenty-five people from the public attended this event. Most of them came, looked, and left, but a few arrived early and stayed past 9:00pm. Mike was, of course, the hit of the night with his meteorites.

This event was a huge success. Thanks to everyone who made this event happen - Mike, Ofelia, Paul, Ray, and William, and thanks to the public for attending the event.



Paul Schmidtke and Ray Adams with Ray's telescopes at the ASU West star party of Oct 10, 2018. Photo by Terri Finch.



Mike & Ofelia set up the table of meteorites while Terri Photoibonmbs the photo. Photo taken by Paul Schmidtke.

What's Up For January?

By Don K. Boyd, PAStimes Editor

Name	Date	Rise	Set
Mercury	01-15-19	07:05	16:04
Venus	01-15-19	04:08	14:30
Mars	01-15-19	11:12	23:36
Jupiter	01-15-19	06:14	14:43
Saturn	01-15-19	06:46	16:44
Uranus	01-15-19	12:04	01:08
Neptune	01-15-19	10:09	21:35
Pluto	01-15-19	07:19	17:21

All Times Arizona Time

Bold means the object is "visible" in the evening

January 15 2019

Sunrise: 07:32

Sunset: 17:43



New: January 5



Q1: January 13



Full: January 20



Q3: January 27

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NASA's Lucy Mission

By Sam Insana

Four PAS members take part in an Occultation Timing. On November 12, 13 and 14, 2018, Ted Blank, Paul Facuna, Rick Cunningham, and Sam Insana assisted with the timing of an occultation of a 15.75 magnitude star by the Trojan Asteroid Luceus.

The four of us joined forty others from several other states, to do timings between Tucson and Phoenix at 4 km intervals. Two astronomers staffed each 16 inch Dobsonian telescope which had GPS, tracking, GOTO, computers, video cameras, power supplies, laptop monitor, and other equipment which had to run perfectly if the timing was to succeed.

On Monday we met our partners and loaded up the telescope equipment. Monday night was a practice session near Ironwood National Monument northwest of Tucson. There were some scary moments when some of us had problems with various stages of the setup and using the equipment. But by the end of the night it looked like we knew how to handle everything.

The next morning some of us drove to various possible sites. My partner Jerry Bardecker from Carson City, Nevada, and I drove northwest of Picacho Peak to be on our assigned chord (the line where we were to take our data that night). One spot had no trespassing signs. Another was too close to a road that might have vehicle headlights interfere with our task. We finally found a flat, open field with no lights or visual obstructions. We asked the farm workers if we could set up for a few hours at night and they said it was no problem since the fields had been harvested and no activity would take place.

When we got to our site in the late afternoon, there was some 10 to 20 mph winds. We found a large ten foot tall bale of hay that would block the wind. It also blocked the lights from a nearby prison.

There were unexpected high thin clouds moving in and we knew it would be difficult to see our very dim star. The 36% moon, ten degrees from our target star also posed a problem, but we had no choice but to set up.

At the time of the Occultation timing 8:08 pm local time, we got lucky since the clouds had opened up and we had a good

view of the star on our monitor. The entire occultation would be less than 3 seconds but we recorded the event 5 minutes before to 5 minutes after just to be sure we caught it.

The data we recorded would be analyzed along with the data from the other telescopes and hopefully help NASA figure out the asteroid's size, shape, trajectory, speed, position, etc.

This asteroid, Luceus, is a trojan sharing the same orbit as Jupiter. It is in a lagrangian point held in a position by the gravity of the Sun and Jupiter. The Lucy spacecraft is expected to launch October of 2021 and take several years to get to Luceus and other asteroids.

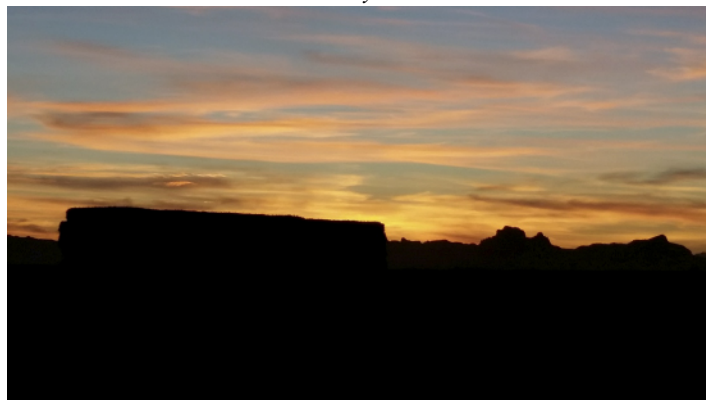
Most of us had sore backs from handling the very heavy equipment. However, we all felt it was worth the effort. Wednesday, after taking off from our Tucson motel, Paul Facuna and I went to Sweetwater Wetlands a few miles away, for some good birding. We also went to Stellar Vision Astronomy to view large amounts of used astronomy equipment. We finally ended up at Starizona, which contains new astronomy equipment. It was like being a child in a candy or toy store.



*Ted and his partner on occultation practice night on Nov 12.
Photo by Sam.*



*Hay blocking the wind during occultation on Nov 13.
Photo by Sam.*



This photo showed the high thin clouds that almost spoiled the Nov 13th Occultation of the Luceus asteroid. Photo by Sam.

Leucus Occultation

By Paul Facuna

My partner for the Leucus occultation timing was Julien Salmon, a scientist working for the Southwest Research Institute researching the origin and evolution of circumplanetary disks and satellites. We met for the first time the afternoon of Monday, November 12, in the staging parking lot. He already had the vehicle loaded with the equipment we were assigned to use. We drove to the training area that was a former missile site, picked a spot on a concrete pad and set up the telescope. Next we tried to collimate the telescope but could not until Julien manually adjusted the secondary mirror that was significantly out of position. Then we could collimate it. We tried to connect the battery pack to the drive motor but could not. After checking the cable end connectors and comparing them to another team's cable ends that did connect properly and work, we discovered that the connectors had come apart. Part by part we removed everything from the parts box until we found the small cable parts at the bottom of the box. Julien reconnected the cable parts. Now the cables connected properly and we had power. No wonder the telescope was so far out of collimation and the battery pack connectors had come apart because it had travelled so far. These telescopes and equipment had been transported to Cape Town, South Africa and to South America and used for the occultation timings of Kuiper Belt object 2014 MU69 (Ultima Thule). We aligned the scope to two bright stars and the planet Mars then fine adjusted the alignment to the target star.

Note; Ted Blank and Paul Maley, members of PAS, were involved in the

occultation timings of Ultima Thule and traveled to South Africa and South America for the timings. Ted Blank gave a presentation to PAS on the New Horizons Mission and his experiences performing the Ultima Thule timings this past fall.

On Tuesday, we drove to the location Julien had found on Google maps that was close to the track on which we were assigned to time. When we arrived at the turn off we found that the location was on public trust land that was also used by the military and could only be used by the public with a use permit. Julien found a QR code on a sign that took him to a website where he bought an overnight use permit so we were covered. We drove for several miles on a dirt road almost to the center of the track we were assigned to for the timing. We drove off the road onto a flat open area, scouted the area and picked a flat spot to set up the scope that was just a few meters from the center of our assigned timing track. Just before we began setting up, a rather beat up old car went flying down the dirt road raising a dust cloud. Since the scope was not set up and we were far enough away, we thought the dust would not affect the scope as long as the car did not drive by frequently. We set up the scope, it had held the



*Paul Facuna helping his partner on practice night Nov 12.
Photo by Sam Insana.*

collimation from the evening before and the battery cable connectors were intact. Now we waited for darkness so we could align the scope. While waiting a heavy truck/trailer drove down the dirt road rather quickly making a lot of noise but did not create any ground vibrations that we could feel and that might have shaken the scope. This vehicle would make two more back and forth trips while we were there. We aligned the scope and waited for the occultation. While waiting, Julien noticed that the stars on the screen were very slowly drifting. He adjusted the scope back into alignment. Shortly before we were to start recording he aligned the scope again. We noticed that there were very thin clouds in the sky near the target star. We hoped they would not interfere with the timing. We started recording at the designated time. Afterwards we took down the equipment and headed back to the staging area.

Bookmans Telescope Workshop September 23, 2018

By Terri Finch, Event Manager

Before we knew it, it was time to be at Bookmans for the Telescope Workshop in September. William and Terri Finch met up with Rodney Fong and set up for the event. Roger Anzini was also there shortly after we started to set up. By 3:10pm, Ken and Sandi Milward were at the event. After we got the table organized, we asked Ken to bring in his Meade 90 EXT telescope. He set it up and we waited for Bruce Wurst to arrive from Flagstaff.

While waiting, Vern F. arrived. He

owns a Celestron 8SE but didn't bring it along. He joined William and Terri at the table to chat about various factors of owning a telescope.

Around 4:00pm, the last set of people arrived, a family of four, Carli Derifield, her husband and two kids. They brought their Celestron Astromaster 130. Roger assisted Carli.

We also had five walk-ins who picked up information about our events. I wish to

thank Bruce and Roger for being at this event to help out. All of us were talking with Kevin until 6:30pm (the event is from 3:30 to 5:30pm). And a few of us, as we left, hung out outside with Kevin until 6:45pm.

Welcome new PAS members: Carli Derifield and Ken and Sandi Milward. It was a very successful event. Looking forward to the next events like this one on October 21, and November 18.



January's Evening Eclipse and Morning Conjunctions

By David Prosper

Observers in the Americas are treated to an evening total lunar eclipse this month. Early risers can spot some striking morning conjunctions between Venus, Jupiter, and the Moon late in January.

A total lunar eclipse will occur on January 20th and be visible from start to finish for observers located in North and South America. This eclipse might be a treat for folks with early bedtimes; western observers can even watch the whole event before midnight. Lunar eclipses takes several hours to complete and are at their most impressive during total eclipse, or totality, when the Moon is completely enveloped by the umbra, the darkest part of Earth's shadow. During totality the color of the Moon can change to a bright orange or red thanks to the sunlight bending through the Earth's atmosphere - the same reason we see pink sunsets. The eclipse begins at 10:34 pm Eastern Standard Time, with totality beginning at 11:41 pm. The total eclipse lasts for slightly over an hour, ending at 12:43 am. The eclipse finishes when the Moon fully emerges from Earth's shadow by 1:51 am. Convert these times to your own time zone to plan your own eclipse watching; for

example, observers under Pacific Standard Time will see the eclipse start at 7:34 pm and end by 10:51 pm.

Lunar eclipses offer observers a unique opportunity to judge how much the Moon's glare can interfere with stargazing. On eclipse night the Moon will be in Cancer, a constellation made up of dim stars. How many stars you can see near the full Moon before or after the eclipse? How many stars can you see during the total eclipse? The difference may surprise you. During these observations, you may spot a fuzzy cloud of stars relatively close to the Moon; this is known as the "Beehive Cluster," M44, or Praesepe. It's an open cluster of stars thought to be about 600 million year old and a little under 600 light years distant. Praesepe looks fantastic through binoculars.

Mars is visible in the evening and sets before midnight. It is still bright but has faded considerably since its closest approach to Earth last summer. Watch the red planet travel through the constellation Pisces throughout January.

Venus makes notable early morning appearances beside both Jupiter and the

Moon later this month; make sure to get up about an hour before sunrise for the best views of these events. First, Venus and Jupiter approach each other during the third full week of January. Watch their conjunction on the 22nd, when the planets appear to pass just under 2 ½ degrees of each other. The next week, observe Venus in a close conjunction with a crescent Moon the morning of the 31st. For many observers their closest pass - just over half a degree apart, or less than a thumb's width held at arm's length - will occur after sunrise. Since Venus and the Moon are so bright you may still be able to spot them, even after sunrise. Have you ever seen Venus in the daytime?

If you have missed Saturn this winter, watch for the ringed planet's return by the end of the month, when it rises right before sunrise in Sagittarius. See if you can spot it after observing Venus' conjunctions!

You can catch up on all of NASA's current and future missions at nasa.gov



Have you ever wondered how eclipses occur? You can model the Earth-Moon system using just a couple of small balls and a measuring stick to find out! The "yardstick eclipse" model shown here is set up to demonstrate a lunar eclipse. The "Earth" ball (front, right) casts its shadow on the smaller "Moon" ball (rear, left). You can also simulate a solar eclipse just by flipping this model around. You can even use the Sun as your light source! Find more details on this simple eclipse model at bit.ly/yardstick eclipse

Binocular Class in Carefree September 8, 2018

By Terri, Event Manager

It was the perfect temperature, through the entire event, to have this event up in Carefree. We had a few more RSVP's than those that showed up, but we did have a great event with these PAS Members: Calvin Vance, Stuart Brackey, William and Terri Finch, Sam Insana, Howard Moneta, Don Boyd, Paul Facuna, Kay Freeman, and Ron Walker. We had a new friend join us this night, Mel McClure who is the daughter of Kimberly Hollingsworth who joined PAS on this night. Congrats to Kim and Mel for becoming PAS Members!

The evening started with the potluck dinner about 6:20pm. We ate, we enjoyed the company of everyone, and we had a great dinner. Then, we waited a little longer than originally planned to start the event because there were four public and two PAS Members who didn't show up. So, the class that was to start at 7:00pm started at 7:30pm.

I wish to thank everyone involved in the teaching of this class. We had Sam start the class and he presented on How Binos Work, then went on with How to Mount Binos on a Tripod and then he talked about the Exit Pupil on the Binos and why it is important to pick an exit pupil that fits your eye's ability to see.

Paul took the floor next and shared the Pocket Sky Atlas by Sky and Telescope. He went over the data this really awesome sky chart offers both binocular and telescope viewing.

Sam then discussed a book he likes to use called Binocular Highlights.

Calvin aroused everyone's interest with a talk about the coating options for a pair of binoculars and the pros and cons of having that coating. He went over which binoculars to purchase and which are not worth your while, whether you are purchasing a new pair from a retail location or a second-hand pair.

Stuart added information he just learned that night from Sam about the mounting of binoculars on a tripod.

Sam then led a short discussion about what brands of binoculars he prefers and the conversation about preferred models of binoculars continued around the room, from those who own and love their binos. For those taking notes, some brands that weren't so great were also mentioned.

Terri then went over the plan for the

night with the September sky chart. The plan was that everyone would take a pencil and mark on the sky chart where the objects were that night through the binoculars, so that each could take this chart home with them, and look at those objects from home through the rest of September.

The attendees of this event then moved outdoors. Mike had set up a wonderful collection of chairs for this event. Thank you, Mike, for doing that ahead of time. We all gathered in the observing area at the back of Mike's house. We just missed Venus, but we enjoyed Jupiter, Saturn and Mars to orient ourselves to the night sky and the dark. Howard and Sam took turns showing objects, talking about the objects, sharing the info about those object, and we saw these objects in our binoculars on this night: M22, Lagoon and Triffid Nebula, Ring Nebula, M13, Andromeda Galaxy, Perseus Double Cluster, and the Coat Hanger asterism. Between each object, Howard did a spectacular sky tour of the constellations along with myths, stories, and more. Ron also helped out with the myths of some of the constellations. At about 10:30pm, we went indoors as a group, enjoyed some great ice cream bars provided by Sam - thank you so much, Sam. If I had thought ahead, I would have brought some as well. Then, Kay left for the night. We then went back outdoors and while waiting for our eyes to become dark adapted, Paul and Terri took a short nap, and Howard watched Auriga for the arrival of his next object to share. It was 12:30am when the party broke up and many attendees headed home. It took Ron, Paul, Sam, William, Don, Mike, and Terri some time to clean up, put away tables, and put our stuff away from the class. At about 2:00am William, Terri, Don, and Paul were last to leave. Mike was in bed before William and Terri drove home, as we were putting things away while we still had a little ener-



Calvin shares which binoculars are great for astronomy and which ones to avoid. This was a fantastic addition to this class.

Photo by Don.



Calvin & Sam share their binocular experience with the attendees at this event. Photo taken by Don Boyd.

gy before getting home dead tired at 2:45am, and not wanting to do the organization at that time.

Thanks to everyone who attended. Those who missed this event, really missed some great advice and info provided at this class. Hope to see you at the next fun PAS Event.

Stuart Brackney writes: As a new member of PAS, and having so little knowledge of all there is to learn, I was oh so pleased to attend this workshop class on binoculars. Not only was the location fabulous, the sky was amazing, and the information shared by Sam, Howard, and Calvin was oh so helpful. I am impressed with all who attended, those who share their wealth of knowledge, and others like me who are eager to learn. Thanks for the opportunity.



Sam shares his experience with his binos. Photo by Terri Finch.

70 Years Astronomy Celebration of PAS October 11, 2018

By Terri Finch, Event Manager

PAS's 70th Year as an Astronomy Club was a huge celebration. We held this event at Black Mountain Campus of Paradise Valley Community College. While it was cloudy outdoors on this night, it was very busy, fun, educational, and a great time indoors.

Many thanks go to all the various attending PAS members who helped make this event a success by bringing their telescopes. We didn't get to set them up, but I appreciate having them there in case we could have set them up.

Many thanks to the Honored Guest Speakers of this event: Mike Marron, Ron Walker, Bill Powell, Sam Insana, Calvin Vance, Ray Adams, and Bruce Kosaveach.

If you wish to see what we did at this event, go to this link where all the activities were announced, planned, organized and updated as needed: <http://www.pasaz.org/forums/showthread.php?t=1299>

Thank you to the PAS members and PVCC honor students who provided multiple demonstrations and activities for the attendees to enjoy. Sam Insana and Vera Stiesmeyer provided the History of PAS

table. Since it was cloudy, Frank Insana also assisted at the History of PAS table. Terri and William Finch with Storm Moon and Bruce Wurst ran the PAS Table <http://www.pasaz.org/> and the Free Raffle.

Many thanks to the Sponsors, who donated items for the Free Raffle at this event: Astronomy Magazine <http://www.astronomy.com/>, and Sky & Telescope Magazine <http://www.skyandtelescope.com>.

Donations were given by these PAS Members: Sam Insana, Frank Insana, Paul Facuna, and Bruce Wurst. Infiniti-tees <http://www.infiniti-tees.com/>, Flandrau Science Center <https://flandrau.org>, Lowell Observatory <https://lowell.edu/>, Night Sky Network <https://nightsky.jpl.nasa.gov>, Astronomical Society of the



During set up for this huge event, Don Boyd caught a photo of (Left to Right) Paul Facuna helping Rick Cunningham hang the posters around the walls. Terri Finch and Storm Moon are setting up the PAS Table for the Raffle. Photo by Don Boyd.



The PAS History table organized by Sam Insana had the best backdrop of the starry sky, of all the tables in the Aquila building. Frank Insana, Vera Steismeyer and Sam Insana are standing against the Stars and Constellations backdrop while Julie & Ron Walker are sitting in the chairs in the front talking about the history of PAS. Photo by Don.



Basis Mesa school brought 25 paintings done by the students of Ashley Moyer, Art Teacher, in different mediums, on canvas, to put on display. The paintings were awesome! Here are 8 of paintings that were on display. Photo by Ashley Moyer.



These paintings were lined up on tables along the wall in the classroom in the Aquila building. Many thanks to Ashley for bringing them to our wonderful event & to Jon Hutman for stopping by at the end of the event to pick them up and take them back to Basis Mesa for an event they were created for at the school. Photo by Ashley.



To thank the students at Basis Mesa for letting PAS borrow and their wonderful art work, Frank Insana donated a collection of beautiful 3-D stickers for which Storm and Terri put on the back of the canvas of each painting. Photo by Ashley.

Pacific <https://www.astrosociety.org>, Orion Telescopes <https://www.telescopes.com/>, and the Phoenix Astronomical Society <http://www.pasaz.org> also donated a few items to make the raffle that much more fun for all attendees.

The free raffle consisted of sixty items of which thirty-seven items were raffled; the remaining twenty-three items will be raffled at the November 8, 2018 BMC Star Party.

And a very huge thank you must be given to Courtney Banach who helped me with printing signs and organizing the rooms for the various demonstrations. Unfortunately, she couldn't attend the event and experience the result of all the work she had put into this event, but, I give her a ton of thanks.

I also wish to thank Daren Dorm who assisted in place of Courtney at the event, and managed the set up and take down of the tables in the rooms, and was absolutely awesome help at the event.

Attendance was probably less than we had anticipated due to the cloud cover. I had about two hundred RSVPs by email, where one email might have up to six persons attending. When I decided we were doing the event even with the clouds, I sent emails to all two hundred of the people who RSVP'd they were attending, confirming we were doing the event. Most didn't reply, but a few said that they had already changed their plans for the night. The actual count of the attendees was about sixty-five persons of all ages from the public (this was counted accurately by giving out a different color raffle ticket than the attending helpers at the event were given - the public got the green tickets and everyone who helped at the event got the red tickets).

Helping at this event we had eight PVCC honor students who did various demonstrations, maybe more as some of them never came to get a raffle ticket from me. I wish to thank the eight honor students who did sign in with me and then did various STEAM demos and activities that night: Anthony K., Deborah C., Hanna C., Bradley M., Emily H., Ally B., and Eric R. We also had two Lowell Observatory persons: Bruce Kosaveach and Stephen Riggs. There were thirty PAS members attending, and some members brought their spouses to help out, or just for the fun of it. It was a great turnout of attendees, even with the cloudy skies.

We had a wonderful gal, Ashley Moy-

es the Art Teacher from Basis Mesa School, with her art students Space Art on canvas. She provided twenty-five easels and art pictures on display. Each art piece got a 3D sticker put on the back of it to thank the students who did the art for this event.

Ashley Moyes writes: *Thank you for including our solar event. It was a great day for your daughter, and she was helpful and which was really nice. I took at the PAS event. The kids love the stickers you put on the back. Have a great day.*

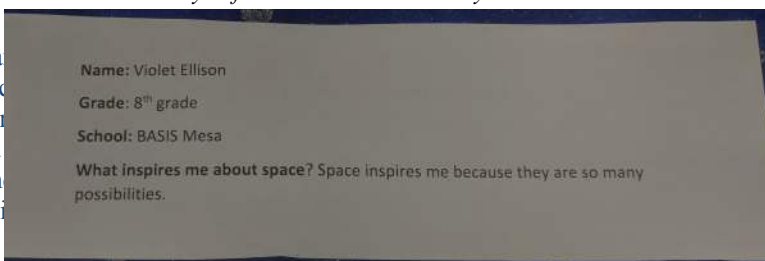
Stu Brackney writes: As a new member of this club I would like to say..... you people do it right and oh so thoroughly. I totally enjoyed this event. Thanks for all of the hard work and coordination to get such accomplished.

Sam Insana writes: I want to thank all the PAS members and others who participated with the planning, setup, presentations, exhibits, posters, children astronomy games, school artwork, etc....

Ray Adams for his Astrophotography presentation, Mike Marron for his Astronomy 101 presentation and meteorite exhibit, Bill Powell for his Spectroscopy presentation and exhibit, Ron Walker for his Planetarium presentation and exhibit, Calvin



With the help of a few PVCC Honor Students, PAS had a coloring station set up for any kids who wanted to color and receive a 3-D sticker as a reward for their art. One student did the coloring but didn't take their art home with them, so I sent it with Jon Hutman to Basis Mesa, where the student listed they were from. And before it left PVCC, it had a nice 3-D sticker on it. Thank you for the art work! Photo by William Finch.



Ashley told me that she asked her students to produce a picture having to do with "Space" and she left it open ended as to what they produced. Then she picked the top 5 pictures from each of her 4 art classes to bring for this event. It was a spectacular display and everyone loved it. Thank you Ashley! This picture sums it up! Photo by William.



At the History of PAS presentation put on by Sam Insana, this photo was projected up on the screen in the classroom. Many great Guest Speakers have come to PAS with presentations to Wow the attendees. Photo taken by William.

Observatory presentation. I gave a presentation on the 70 year history of PAS and set up exhibits for guests to look at.

Terri did a great job with logistics getting PVCC BMC to help set up tables, chairs, AV equipment, rooms, signs, etc...Terri also ran a fun raffle and worked many hours with Mike Marron, Paul Facuna, Don Boyd, Pete Turner, Rick Cunning-

ham, William Finch and myself helping to plan this large event. The helpers like Paul Facuna, Don Boyd, Rick Cunningham, Storm Moon, William Finch, Frank Insana, Vera Stiesmeyer, Ofelia Waters, and others from PVCC BMC did a great job on the day of the event. About three dozen astronomy posters were put up on the walls to decorate the hall, and everyone seemed to enjoy them. Students from Basis Mesa School provided original artwork with a space theme. The art was beautiful and PAS provided each student with holographic astronomy stickers thanking them.

Several PAS members: Frank and Sam Insana, Bruce Wurst, and Paul Facuna donated items to be raffled: such as tickets to the Arizona Science Center, Meteorites, Astronomy Books, Astronomy Posters, Astronomy holographic stickers, etc..... Others from the community like Lowell Observatory, Infinites, Astronomy Society of the Pacific, Sky & Telescope, Astronomy Magazine, Night Sky Network, Flandau Planetarium, Orion Telescopes, and others also donated many items. We had about sixty items to raffle off free to people attending. There were approximately one hundred people attending the celebration, although many more had RSVP'd. The cloudy skies and threat of rain probably kept many people away, so PAS only raffled off about thirty items and the other thirty items will be raffled off on November 8th at the next PAS star party at PVCC BMC to end our 70th anniversary celebration.

Terri and I provided astronomy crossword puzzles, connect the dots, word games, pictures to be colored, and an astronomy treasure hunt game. No small children showed up, but some Big Kids had fun playing the games. Several of these kids were from Basis Mesa School and attended

with their families.

Many thanks to all PAS members who brought their telescopes and left them in their vehicles just in case there was a break in the clouds.

BMC PVCC had a small STEAM event at the same time and those activities added to the fun. Many PVCC Honor Students ran those demos and activities.

This event was six-plus months in the planning and took many hours of work. I hope everyone enjoyed the experience. The Phoenix Astronomical Society has a proud 70 year history and the members make the club one of the finest around. All of our members should be proud. Thanks to all of you. Sam Insana PAS member for 32 years.

Guest Speaker Schedule

Lectures are located in
Room #134

5:30	Dan Heim: "Light Pollution"
6:00	Calvin Vance: "Enjoying Astronomy on a Budget"
6:30	Bill Powell: "Star Light Star Bright"
7:00	Bruce Kosaveach: "The Future is Bright at Lowell Observatory"
7:30	Ron Walker: "When the Earth Doesn't Rotate Fast Enough"
8:00	Sam Insana: "The 70 Year History of PAS"
8:30	Mike Marron: "Astronomy 101"

PAS had a super line up of Guest Speakers for this event. Many thanks to those Guest Speakers who shared their knowledge with the attendees. Photo by Terri Finch.

PVCC Telescope Workshop October 19, 2018

By Terri, Event Manager

The sky was clear, the temperature was nice, and we had a great turnout for this telescope workshop inside G-147. We didn't make it outside to enjoy the night sky. From PAS we had Rodney Fong, Rick Cunningham, plus William and Terri Finch. From the public, we had Nick Antognini who didn't bring his scope, but knew what the issue was and he talked to William and Rick for a long time from the very start of the event. Nick left about

7:40pm. We also had Ken and Sandy Milward, current PAS members, who had attended a previous Bookmans telescope workshop and brought their Meade 90 with them. Ken was having control issues with the go-to portion of his scope. Rick started helping them and then William assisted as well. They left about 8:30pm. Janice and Tom Carse came to find out what scope to purchase, listened to everything, everyone, all the conversations and then left about

7:45pm. We had one other RSVP but she never showed up. So, Rick, William, Rodney and I took a brief vote and decided to pack it in at 9:00pm. It was a successful event. Thank you, Rick and Rodney, for assisting at this event. Looking forward to the next Telescope Workshop at PVCC on November 15, 2018. Please note: There are no Telescope Workshops of any kind during December due to the DBG Luminarias.

Anasazi School Star Party November 2, 2018

By attending Telescope Team members

Terri, Event Manager writes: Attending this event was Pete, Roger, and Rick with their telescopes. Mike brought his meteorites and had Ofelia Waters as his helper.

Pete writes: Roger Anzini (16-inch dobsonian), Rick Cunningham (8-inch dobsonian) and Pete Turner (12-inch dobsonian) provided telescope views to the

students and parents of Anasazi school in Scottsdale. Mike Marron regaled students with his meteorite display. The following objects were viewed: Mars, Saturn, Andromeda Galaxy, ET Cluster in Cassiopeia, Albireo double star in Cygnus and the Pleiades.

Rick writes: Mike Marron, Pete Turner, Roger Anzina, Rick Cunningham were present. Seven pizzas, two bags of chips, and donuts were provided by the school for four Telescope Team members. Overfed? Some high thin clouds, moderate seeing. Tonight I showed Mars, NGC 457, M31, and Iota Cassiopeiae Variable Double.

PVCC Community Breakfast November 15, 2018

By Terri, Event Manager

I wish to thank PVCC for inviting PAS to attend the Non-Profit Community Breakfast held this year on November 15th at 7:30am. Although the time of the breakfast was way too early for me, I attended. The breakfast was awesome and the opportunity to network with other non-profit groups was fantastic. I attended the breakfast last year as well, but I was better prepared this year to promote PAS while there, and to find out about other non-profit organizations. I met with the Girl Scouts Represent-

tative and many other organizations who may be interested in having PAS bring telescopes to their events.

While there, Becky Barndt, Office of Development, Alumni and Community Relations of PVCC, interviewed me about PAS and what we do at the college. I told her about our free telescope workshops, the huge star parties we do at Black Mountain Campus and our monthly meetings with guest speakers. We also do other events at the college depending on what Jenny Weitz

or other teachers at the college wish for PAS to do. Later that evening, Becky attended our PAS free telescope workshop. Here's the link to her online newsletter for PVCC:

<https://myemail.constantcontact.com/PVCC-News---Events--PVCC-Heats-Up-for-New-Academic-Year.html?soid=1104029799993&aid=c9-kwem5VeE> Looking forward to the breakfast again next year, but hopefully a little later in the morning.

Bookmans Telescope Workshop November 18, 2018

By Terri, Event Manager

It was a beautiful, chilly day outside, but indoors it was hopping!!! There were three RSVP's due to attend and two showed up. I wish to thank Quentin Chen and Diane Hakala for attending this event. Quentin arrived about 3:20pm just as we were getting done setting up for the event. We started talking telescopes about 3:30pm and both Quentin and Diane stuck around for the whole time listening, taking notes, asking questions, etc. Quentin came to the workshop wanting to know what telescope to purchase. We gave him tons of choices. William, Roger and Rodney chatted with Quentin for most of the event. Diane came to the workshop with her 10" meade LX200 EMC and Bruce assisted her with her

scope. Diane thought maybe her scope needed collimation and Bruce verified it, and helped her figure out what additional items to order for her scope.

Attending from PAS at this event was Rodney Fong, of great assistance in moving Diane's scope in and out of Bookmans; Bruce Wurst assisted Diane for most of the event; Ed and Bette Wurst chatted with Diane and Quentin; Roger Anzini, William and Terri Finch and Rick Cunningham assisted Quentin for most of the event. Everyone sat around the PAS table for another forty minutes of discussion before the workshop ended at 5:35pm.

I wish to welcome new members: Quentin Chen and Diane Hakala to PAS!!!

And many thanks to Bookmans for providing the space to hold the event at the front of the store.

Bruce, Ed and Bette Wurst, along with Donna and Helen Zander, Rodney Fong, William and Terri Finch, and Steve Palmer went to Carlos O' Brien's for Ed and Bette's 61st Wedding Anniversary and Dinner after the Telescope Workshop. Many thanks to our favorite waiter, Daniel, for making the night special. PAS is looking forward to the next Bookmans Telescope Workshop at 19th Ave and Northern Ave in Phoenix in 2019 on Jan 6th, Feb 10th, and Mar 17. Bookmans Free Telescope Workshops are held once a month, almost every month.

Japanese Friendship Garden Star Party

October 26/27, 2018

By Terri, Event Manager

What is Otsukimi? This is the Annual Moon Viewing Festival held at the Japanese Friendship Garden of Phoenix. This festival consists of music, entertainment, and Japanese foods to celebrate this event. The location of the Japanese Friendship Garden is on top of the Deck Park Tunnel in downtown Phoenix. This event is the second year in a row PAS has provided telescopes to view the moon. It was lucky that more than just the moon was visible, considering the buildings, trees, and other obstacles that had to be worked around, in order to see planets. From this light polluted location, only very bright objects such as the planets and the moon were visible.

Friday, Oct 26 the Telescope Team of William and Terri Finch, Sam Insana and Don Boyd attended the Otsukimi Annual Moon Viewing Festival. William and Terri arrived at 5:40pm for set up. The gate guard was ready for our arrival, but didn't want us to park where we were, which was at the back gate, so I contacted Raina to get permission to stay where we were parked. Once that was done, Sam arrived with Don in one car. Set up was scheduled for 5:00pm to 6:00pm. The event was scheduled originally from 6:00pm to 9:30pm, however, in looking at a flier I found at the event the next night, I noticed that the event time was actually 6:30pm to 10:00pm, but didn't know that until nearly 10:00pm this night.

The moon was the main focus of the evening. The waiting crowd was ready to see the moon at 6:30pm when the sky grew dark, however, it didn't rise above the trees until 8:30pm. Don had his scope on Saturn for part of the night, then Mars, until the trees stole both objects. We waited a bit, then moved Don's scope to a better location and he showed the moon from about 8:45pm to 10:00pm. The public loved the moon!

Sam had brought his meteorite collection and was showing everyone the meteorites. I had set up Sam's table long ways connected to the PAS table. This worked very well for the lighting and for talking to people. William and I took care of the PAS table and we promoted the November 8, 2018, Black Mountain Campus event every chance we got. I handed out a ton of fliers and information about PAS.

The evening was fun and exhausting, and our voices sounded like we had talked way too much during the four hours at the PAS table, telescope and Meteorite table.

For food and drink at the event, Raina supplied bottled water for the Telescope Team on both nights, but we had to find our own food. There were four food stands at the event with a variety of foods to enjoy. This night William, Sam and I had food from these vendors.

Sam writes: It was a beautiful night with hundreds of people. Many visited my meteorite table. I showed them lunar, martian, and eighteen other specimens. The number one question was "how do you know it was from the moon or Mars?" Analyzing the chemical composition of the minerals and gases and comparing the proportion of these to minerals and gases of lunar and Mars rocks found with Apollo mission and Mars rover missions gives us the best answers.

Don adds: I showed Mars, Saturn, and the moon...when they weren't playing hide and seek with all the tall trees around where we were set up.

Saturday Oct 27, started with William and I arriving around 5:30pm this time. We set up in the same location but Sam wasn't there with his meteorites so I had one table I set up for PAS and gave the other table to Don to use for his telescope equipment which we put away at the back of the set up area.

This time we had William and I at the PAS table and we had Paul Facuna as Don's ride to the event, plus a helper. Paul was awesome and so helpful. Thank you, Paul! Don set up at the location he was at in the earlier part of Friday and then we had to move him again to be able



*William & Terri are seen at the PAS Table on Oct 27.
Photo by Don Boyd.*



William & Don are at the well lit, RED lighted PAS Table. The lights were needed to draw people over to our table. It is dark where we set up for this event. It was a wonderful night. Photo by Terri on Oct 27.



*Sam with his meteorite table and a crowd around him at the Japanese Friendship Garden on Oct 26.
Photo taken by William Finch.*

to catch the Moon later in the evening.

For most of the night, Don was able to grab Saturn again, and then Mars, but the moon would not rise above the trees until about 9:10pm this time. So, we moved Don to the other side of the table again at about

9:20pm, and he was able to catch the moon for the last thirty minutes of the event.

On Saturday, because the people were wanting to see the moon and it would not be available until later in the evening, I asked the trees to move so we could see the brighter objects Don was sharing with the attendees, and all the trees did was “wave” back at me in the slight breeze.

We had a surprise visit from a PAS Member, Tom Stoffer and his girlfriend Barbara. They hung out with the PAS table for most of the evening and left before the event ended.

This night, the food stands were in slow mode. There were over two thousand people in attendance and there was a forty-five-minute wait to get food once it was ordered. Luckily, William and Paul went to get food earlier, rather than later; however, Tom and Barbara spent over one and a half hours waiting for their food orders.

The entertainment that night was fantastic, just like last year. It was all similar, but with a few changes. We were so busy at the PAS table, I didn’t get to see much of the show this year. The PAS table was

crowded all night long. It was an exhausting event but I do appreciate that the skies were totally clear for viewing, no clouds at all, with the exception of the trees who just wouldn’t move out of the way of the views of Saturn, Mars and the moon.

I wish to thank Raina for inviting PAS back again this year. We did this event last year and I felt it was well worth the chance to share the night sky with the patrons of the Japanese Friendship Garden again this year. Saturday there were over two thousand attendees and Friday there were about eight hundred visitors. Looking forward to doing it again next year, October 11-12, 2019.



Tom and I enjoyed a wonderful evening at this event. Tom brought Barbara, and she is the one who provided me with this lovely photo from the Oct 27 event.

Gold Canyon Wedding Star Party November 3, 2018

By Pete Turner

On November 3, 2018 PAS provided telescope views for a wedding between Kelly Montoya and Eric Lander in the desert east of Superstition Mountain. The sky was dark with scattered clouds. The following objects were observed through Pete Turner’s 12-inch Dobsonian telescope: NGC 6656 globular cluster in Sagittarius, Saturn, Andromeda Galaxy, Double Clus-

ter in Perseus, M57 nebula, Pleiades, Albireo double star in Cygnus. Andromeda was the hit of the evening as it was large and bright at 38x magnification.

Terri, Event Manager adds: The contact for this event was the Wedding Planner, Deanne Morian and she was on top of everything and so efficient in the set up of the telescope from PAS. Thank you Deanne

for having PAS at this wonderful event!

Deanne writes: The star party went well. Thank you! Peter was knowledgeable and kind. Guests enjoyed it. My staff enjoyed it as well.



Black Mountain Campus November 8, 2018

Star Party

By Various PAS Members and Attendees

Rick Cunningham writes: Tonight's inside crew was William and Terri Finch and Mike Marron. The telescope team outside included Calvin Vance, Sam Insana, Ray Adams, Pete Turner, Don Boyd, Mike Cawley, Frank Otsuka, and myself. Per BMC policy Paul Facuna and Ron Walker were guiding traffic. Other club members were circulating and assisting inside and out. The seeing conditions were fair with occasional passing clouds. Since there was a "Treasure Hunt" of object types for students to see this evening, we coordinated to ensure there was no duplication of objects being shown. Tonight I was showing Mars, NGC 457, M45, Eta Cassiopeiae Achird Variable Double, and Iota Cassiopeiae Variable Double (still no triple). There were fewer attendees tonight than at prior events.

Terri Finch adds: Tonight had, indoors, a raffle of the 25 items left over from the October 11, 2018 70th Year PAS Anniversary, plus a few more donated at the November 1 PAS Meeting. All prizes were awarded and picked up at this event by the public.

The PAS table also had new members join the club: Welcome Annette and Jeffrey Filer. PAS also had three members renew their membership. Thank you for being a 2019 member of PAS!

To occupy the under eighteen crowd, I did Q&A with prizes on this night, and about nine kids took home prizes. For those of you who don't know... I take prizes with me to school, Scout, and BMC events, as well as other public star parties. When the kids stop at my table, and correctly answer a question I ask them about something they

saw through the telescopes, or something they learned from Mike and his meteorites, or a general astronomy open ended question, they get a prize. If their answer is not correct, we discuss the answer so they leave with the correct answer. They can stay as long as it takes them to earn two prizes. I have a two prize limit.

We also had the Treasure Hunt. This will be a new addition to the Black Mountain campus events in which everyone doing the Treasure Hunt picks up a pencil and Treasure Hunt page. For this night, and because I knew some of the objects might be difficult to see, I asked that the Treasure Hunters come back with three things written down about the seven Treasure Hunt items on their page they needed to complete to get a prize. The Treasure Hunt items were: A Star (seen through the telescope), a Globular Cluster, a Planetary Nebula, a Double Star, the Moon (which had already set for the night), an Open Cluster, a Nebula, a Constellation, a Planet and a Galaxy. The data I needed from them was the first name of the telescope operator, the name of the object they viewed, and the size of the telescope used to view the object. Then, when they came indoors to collect their prize, they picked their favorite item, for which they had all three answers collected, and told me about that object in trade for a prize. About fifteen kids picked up pencils and Treasure Hunt pages, and about eight of them came back for prizes.

Across from my PAS table with the



Pete is showing M31 Andromeda Galaxy to the attendees of this event at Black Mountain Campus on Nov 8th.

Photo taken by Sam Insana.

above items on it was a table of filled with handouts at the beginning of the event, and mostly empty by the time we had departed.

Mike and his meteorites were set up in the next alcove next to the PAS table. Mike had a crowd all night long. He steals the show, every time.

I wish to thank my Telescope Team. All the scopes reported they had a great viewing night. Many thanks to Paul and Ron for directing traffic. I had about 60 public RSVP's and I would say about 150 total public showed up at this event. It was a super busy night and lots of fun for everyone! I hope to see everyone at the next event like this on January 31, 2019. Please note, these events are always weather-permitting, so be sure to drop an email to Events@pasaz.org with your RSVP to attend and you will get an auto reply. If you send an email after 4pm on the day of the event, the auto reply will let you know if the event is on or off. Hope to see you there!

PAS Meteor Shower and Comet Star Party in

Carefree December 13, 2018

By Sam Insana

On December 13, 2018, from 10:30 pm until December 14, 2018 2:00 am, nine PAS members had a great time at Mike's home in Carefree. Sam found Comet 46p Wirtanen with his binoculars when he arrived at 10:30 pm.

Mike then rolled out a 10-inch Dobsonian telescope. Rick Cunningham then

used the scope to show the comet, which was a large round object, greenish in color, with no tail.

All the attendees then had snacks and hot drinks before braving the cold to do a 30 minute Geminid meteor count from lounge chairs in Mike's backyard.

From twelve midnight until 12:30 am,

the nine of us counted 63 meteors which was a record 126 per hour rate for PAS meteor watching. It was a laid back, relaxing time with no rigid rules and many laughs. Mike Marron, Ofelia Waters, Sam Insana, Paul Facuna, Don Boyd, Rick Cunningham, Pete Turner, and two new ladies from New York enjoyed the astronomical show.

Tonto Star Party November 3, 2018

By Sam Insana

Saturday afternoon, November 3rd, Mike Marron, Ofelia Waters, Sam Insana, and Rick Cunningham volunteered for the Tonto National Monument star party. At 3:00pm, Mike, Ofelia and Sam went through the museum showing the artifacts of the ancient cliff dwellers in the area. Then we hiked up to the actual ruins. The ranger answered all of our questions, and we were allowed to walk into several of the ancient rooms. There was a magnificent view of Roosevelt Lake from the ruins. From 5:00pm to 6:00pm the four of us were treated to homemade hot and spicy chili, sub sandwiches, veggies, chips, cookies, cupcakes and gallons of cold pepsi to keep Mike going.

The Rangers put on a public Power-Point talk on the night sky from 7:00pm to 7:30pm. Rick then showed Mars, the Owl Cluster, and several other objects with his 8 inch Dobsonian telescope. I showed the Andromeda Galaxy, M13 globular cluster, M57 Ring Nebula, and Gamma Andromeda double star with my 8 inch Newtonian reflector. About fifty guests, adults, and children, looked through our scopes and enjoyed the beautiful evening. They also met with Mike and Ofelia and were amazed at the meteorites. We were finished by 9:00pm and all of us made the drive back to the Valley.

The most exciting part for me was when my counterweight slipped off my setup during viewing, and a guest grabbed the OTA before it hit the cement. Great, quick hands. Thank you, sir!!!

Rick writes: Present were Sam Insana, Mike Marron, Ofelia, and myself. I arrived early and hiked to the lower ruins. After the monument closed for the day, the Rangers treated us to a abundance of subs, cookies, cactus candy, EXCELLENT chili, and even Pepsi for Mike. After Ranger Christa's thirty minute presentation the

twenty-nine public attendees had a chance to see Mike's meteorite collection and view images through the telescopes. I showed Mars first, then NGC 457 Kachina Doll aka Owl Cluster, Iota Cassiopeiae Variable Double (trying for the triple), M45 and finally M31 to a late arrival. The Phoenix sky glow was noticeable over a notch in the southwest mountains. Fairly clear skies, but not as good as previous visits.

Christa writes: The event went very well! We had a total of twenty-eight visitors attend the event. We are hoping that there will be a larger turnout once the season picks up a bit over the next few months.

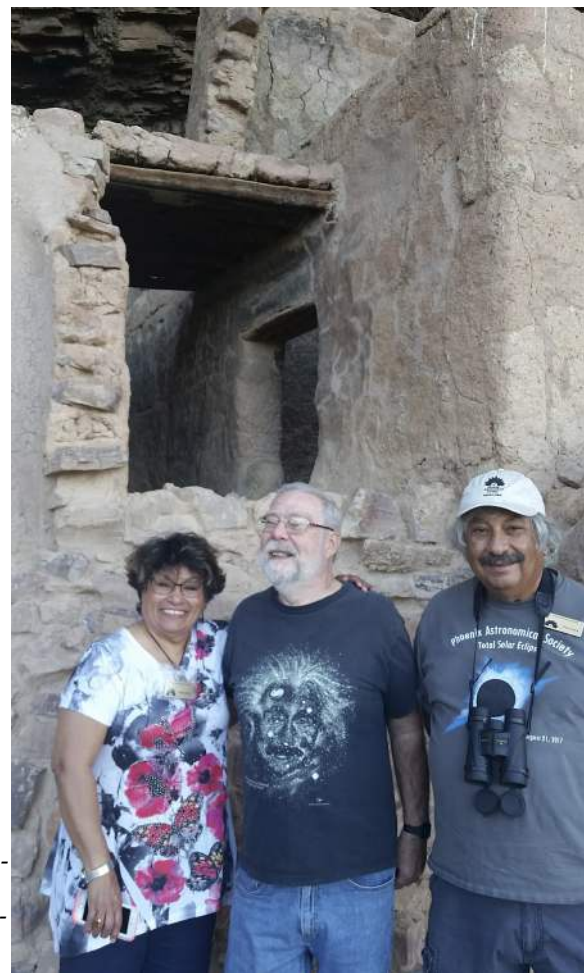
Thank you to all who were able to attend and help us out! We look forward to having PAS at our next event on January 26, 2019.

Tonto National Monument is working on the application for becoming an International Dark Sky Park through the International Dark Sky Association (IDA). Our final measurements were taken after the event on Saturday, and it looks like we are on track for designation as a silver-tier. Thanks to PAS for providing a letter of support!

Mike, Ofelia and Sam enjoying the Tonto National Monument Ruins prior to this evenings' star party on Nov 3. Photo provided by Sam Insana.



Mike & Ofelia enjoy a hike around the ruins. It looks like Mike is hitchhiking in this photo. Photo by Sam.



Country Meadows School December 13, 2018

By Sam Insana

On December 13, 2018, Don, Sam and Paul F, attended the Country Meadows middle school star party in Peoria. After having a nice meal, we set up two 8-inch telescopes. Inside, students and parents were entertained by exhibits from Arizona Science Center, AZ Herpetological Society, Butterfly Wonderland, Wildlife World Zoo, and other places. PAS showed the moon and the Pleiades Open Star Cluster to

about one hundred students, faculty and parents who loved the astronomical wonders. We saw a few fireballs from the Geminids early in the evening. The three of us then went to Mike's place in Carefree to take in the Geminids meteor shower and the Comet 46p Wirtanen.

Sarah writes: Hello All, Well this is a week late but I wanted to give you all a big THANK YOU!! We appreciate you com-

ing out to our schools' science night. Even though our numbers dropped a lot from last year, you still impacted about 220 people which means so much! We appreciate all of you giving up your own time with family to come out and give our kids hands on interactions that some of them would never see/get otherwise. So thank you all and merry Christmas! Hopefully we can have you all back next year!

Tonto

National Park Service
U.S. Department of the Interior
National Monument
Arizona



PARK AFTER DARK

Saturday, November 3, 2018
Space Frontier – 7:00-9:00 p.m.

Saturday, January 26, 2019
Meteor Marvels – 7:00-9:00 p.m.

Saturday, February 16, 2019
Solar System Stroll – 7:00-9:00 p.m.
Lower Cliff Dwelling Night Hike

Saturday, April 27, 2019
Black Holes and Beyond – 7:00-9:00 p.m.

**Please contact Tonto National Monument
for additional information.**

www.nps.gov/tont
Visitor Center: (928) 467-2241
26260 N. AZ HWY 188
Roosevelt, AZ 85545



Explore the wonders of the night at Tonto National Monument. Night sky events will include star gazing, astronomy programs, telescope viewing with astronomers from the Phoenix Astronomical Society, and Junior Ranger Night Explorer activities.

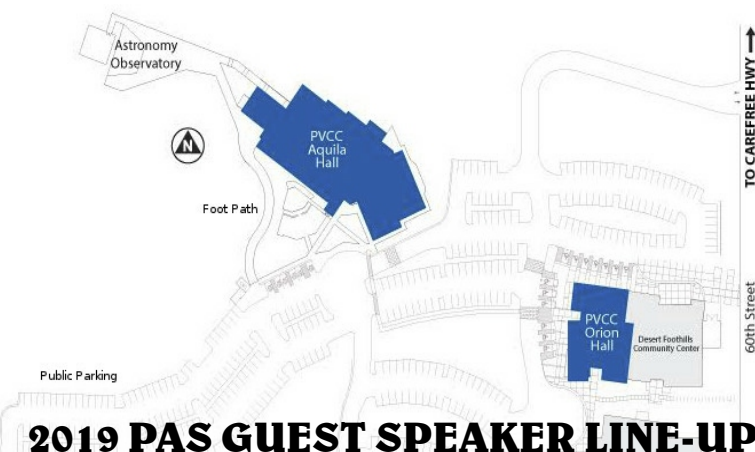
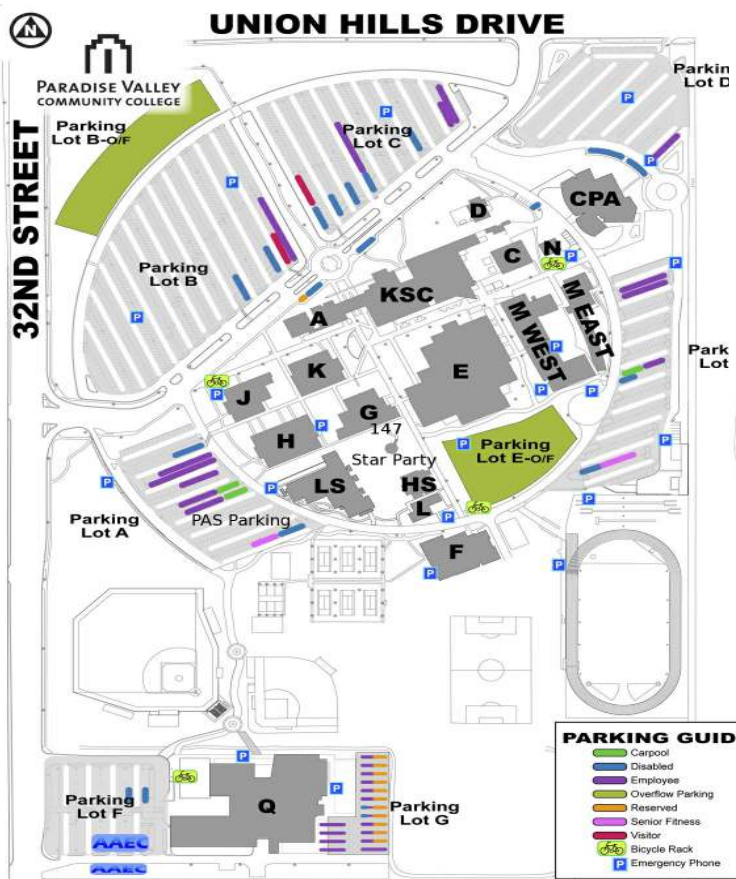
These events are free and open to the public. Bring water and snacks, a red flashlight or headlamp, warm clothing, and closed toed shoes. Join us at the Visitor Center parking lot!

Map of PVCC Main Location

18401 N. 32nd Street | Phoenix, AZ 85032

Map of PVCC Black Mountain

34250 N. 60th Street | Scottsdale, AZ 85266



By Terri Finch, Event Manager Events@pasaz.org

PAS Meetings are held at PVCC Main Campus on the first Thursday of the month in **Room: LS-203** unless otherwise noted. Do you have an idea for a guest speaker? Email Terri Finch, Paul Facuna, or Mike Marron the details (their email addresses are at the top of page 2 in this newsletter).

Here are the next scheduled guest speakers at PAS:

Feb 7: Richard Hawshaw: Topic: Double Star Speckle Interferometry

Mar 6 Wednesday: Jim Renn: "The Vatican Observatory and the Big Bang"

Apr 4 in room **K1000A:** Will Grundy "The findings of the MU69 Kuiper Belt object flyby by the New Horizons mission on March 28th"

More information at:

<http://www.pasaz.org/index.php?pageid=meetings>

January 2019

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
		1	2	3	4	5
6 <i>Free Telescope Workshop</i>	7	8	9	10	11	12 <i>Public Star Party</i>
13	14	15	16	17 <i>PAS Meeting</i>	18	19
20 <i>Total Lunar Eclipse</i>	21	22	23 <i>School Star Party (Private)</i>	24 <i>Free Telescope Workshop</i>	25 <i>School Star Party (Private)</i>	26 <i>Public Star Party</i>
27	28	29	30	31 <i>Public Star Party</i>		