



PAStimes

Phoenix Astronomical Society

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PHOENIX ASTRONOMICAL SOCIETY — ESTABLISHED 1948

“Update on NASA Small Body Missions”

What we know about all the missions to asteroids at Dec 5 PAS Meeting

Data provided by Dr. David Williams, December Guest Speaker.

Dr. David A. Williams is an Associate Research Professor in the School of Earth and Space Exploration at Arizona State University, Tempe, Arizona. Dr. Williams is the Director of the Ronald Greeley Center for Planetary Studies, the NASA Regional Planetary Information Facility at ASU. He is also the Director of the NASA Planetary Aeolian Laboratory, which administers wind tunnels at ASU and the Ames Research Center in California. David is currently performing research in volcanology and planetary geology, with a focus on planetary mapping, geochemical, and remote sensing studies. His research has included computer modeling of seismic wave propagation through planetary interi-

ors, visible and near-infrared spectroscopy of the lunar surface, planetary geologic mapping of the satellites of Jupiter and Saturn, the planet Mars, the asteroid Vesta and the dwarf planet Ceres, computer modeling of the physical and geochemical evolution of lava flows in a variety of planetary environments, and petrologic study of lava samples from Mount St. Helens. He was involved with NASA's Magellan Mission to Venus, Galileo Mission to Jupiter, and Dawn Mission to asteroid Vesta and dwarf planet Ceres. He is a Co-Investigator on the European Space Agency's Mars Express orbiter mission. He is also a Co-Investigator and Deputy Lead for the multispectral imager on NASA's Psyche Mission. In 2014 David was elected a Fellow of the Geological Society of America, and asteroid 10,461 DAWILLIAMS was named in

his honor. He is currently serving as Secretary of the Planetary Sciences Section of the American Geophysical Union.

More about Dec 5 Meeting on page 3



Dr. David A. Williams

Nov 7 PAS Meeting in Review

By Terri, Event Manager

This was a very interesting and exciting meeting. We had the honor of having Kevin Schindler from Lowell Observatory tell us all about what is going on at Lowell. The meeting opened at 7:33pm with President Mike talking about a few brief things... Pete Turner was voted in as new PAS Secretary. Brent Watson was a guest from out of town, now in town for a few months, and then at 7:36pm the meeting went to Kevin. Kevin's presentation was a talk about who Percival Lowell was, and how his family has continued to own, operate and maintain Lowell Observatory. Kevin also told us about the 6 telescopes in the Giovale Open Deck Observatory and the plans for that, as well as sharing info about the Discovery Channel Telescope which is 4.3 meters in size, located outside of Flag-

staff and cost \$55 million to build. Kevin told us about other plans for Mars Hill (the home of Lowell Observatory) with a \$29 million project to expand with the Astronomy Discovery Center which will be 3 stories high and on the very top will be the Dark Sky Open Air Astronomy Deck. This building is planning to be open in Spring 2023. Kevin brought several of his books for sale, and few members purchased from him. It was a very informative and fun presentation. I wish to thank Bruce Kosaveach for attending the meeting with Kevin and for his input into what's going on at Lowell Observatory.

After Kevin did his presentation, the group took a 15 minute break, and most of the Non-PAS Members departed. The break was from 8:45pm to 9:04pm, and the floor was then turned over to Brent Watson.

Bret is an astronomer, currently residing for a few months in Phoenix and he has written many fine finder chart books for astrono-

See "Nov 7 PAS Meeting" on page 4.



Kevin Schindler giving a very informative, captivating presentation about the history of Percival Lowell & the Lowell Observatory at the November PAS Meeting. Photo by Terri Finch.

Phoenix Astronomical Society Contact Info

President	Mike Marron	480-488-3031	President@pasaz.org
Vice President	Paul Facuna	602-246-1554	VicePresident@pasaz.org
Secretary	Pete Turner		
Treasurer	Eric Steinberg		
Event Manager	Terri Finch	602-561-5398	Events@pasaz.org
Newsletter Editor	Don K. Boyd		Editor@pasaz.org
PAS Host	Stu Brackney	480-221-5711	stubrckney@gmail.com
Librarian	Rod Sutter		Librarian@pasaz.org
Member at Large	Jenny Weitz	602-787-6818	
Member at Large/Equipment Manager	Bruce Wurst	602-971-3555	Brulipps@yahoo.com
Webmaster	Chris Johnson		Webmaster@pasaz.org

Phoenix Astronomical Society 3039 W Peoria Ave Ste 102 PMB 188. Phoenix AZ 85029

PAS Upcoming Events for December

By Terri Finch, Event Manager

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>

PAS will be at the December 2019

DBG Luminaria on Nov 29 + 30, Dec 6, 7, 8, 13, 14, 15, 17, 18, 19, 20, 21, 22, 23, 26, 27, 28, 29 30 & 31 weather permitting. Looking forward to seeing you there!

Dec 5: PAS Meeting at PVCC Main Campus in LS-203 at 7pm. More details: <http://www.pasaz.org/forums/calendar.php?do=getinfo&c=2979&day=2019-12-5&c=1>

Dec 12: FREE Telescope Workshop at PVCC Main Campus 7pm to 9:30pm 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&c=2987&day=2019-12-12&c=1>

At the time of completion of this issue of the newsletter, 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: the link is at the top of this article.

Are You Looking For an Astronomy Event to Attend?

By Terri Finch, Event Manager

Here's what PAS does in a year.... The PAS year begins in September when the new officers of the club take their positions. Then, each month, PAS provides fun, educational, entertaining and outreach events for the public to attend, as well as some great private events for its members. The PAS year runs from September 2019 to August 2020.

Each month PAS holds a General Meeting with Guest Speaker, for the months of September to May. That's 9 meetings that have a spectacular Guest Speaker for your education and enjoyment with various fun topics of Astronomy. These meetings are usually on the first Thursday of the month - unless otherwise noted. You can track these meetings by going to the Meetings page on the PAS

website at this link: <http://www.pasaz.org/index.php?pageid=meetings>. This webpage is updated as new speakers are added.

Schedule permitting, PAS hosts the Black Mountain Campus star parties that fall this year in Sept, Oct, Nov of 2019, as well as Jan and Feb 2020, 2 star parties in March and then April of 2020. These star parties are Weather Permitting - if weather permits, we hold the star party. Always drop an RSVP to Terri at StarStuff@gmail.com for these events to make sure you get the cancel notice by 4pm the day of the event. No notice and the event is happening.

PAS also provides 1 FREE Telescope Workshop each month for those folk who want to learn how to better use the telescope they already own, or someone look-

ing to purchase a scope. We give advice only. We have nothing to sell to you at these workshops. The months in which we have the Free Telescope Workshop for this school year are: Sept, Oct, Nov & Dec of 2019, as well as Jan, Feb and April of 2020.

And then for the Members, PAS sometimes hosts a Night Sky Training Session (to be scheduled), A Socializing Party, a Binocular Class, and other fun events open only to PAS Members. To become a PAS Member, please download this membership form: <http://www.pasaz.org/forums/downloads.php?do=file&id=18>.

PAS is known for its Public Outreach and dedication to having fun showing the public the night sky through the various events we do.

More Information About December 5 Meeting

By Terri Finch, Event Manager

PAS is honored to have the return of Dr. David Williams from ASU School of Earth & Space for the December PAS Meeting. David always brings interesting items to give away, such as posters, plus he is so interesting to listen to and the topic for this evenings presentation will knock your socks off! You don't want to miss it.

Also there is a Meet & Greet dinner prior to the meeting at 4:30pm to 6:30pm at Chili's at 7th Street & Bell Rd in Phoenix. PAS Members RSVP is required here: <http://www.pasaz.org/forums/calendar.php?do=getinfo&e=2978&day=2019-12-5&c=1> by the day before so that the day of the dinner, I can call in the reservation for everyone attending. That link also has the details of any changes to the dinner plans. Dinner is open to everyone - you don't have to be a PAS Member, but you DO have to RSVP with me at StarStuff@gmail.com to attend (if you are not a current PAS Member) and be able to sit at the PAS table with David.

Along with Dr. William's presentation is the PAS Annual Swap Meet at the PAS Meeting. Please bring your items for sale and plan to bring plenty of cash to purchase those items you win the bid on. The Swap Meet is open to everyone: you don't have to be a PAS Member to attend and buy or sell your astronomical equipment. The only

catch is that your items for sale must be astronomy related, or used in some way for astronomy purposes, such as observing chairs, flashlights, books, etc.

Set up of the Swap Meet will be down the Right side of the Room when you enter LS-203. Please prepare your items for sale by taking a sheet of paper, preferably 8.5" x 11" and marking at the top of the page what your item is and what comes with it. List everything. Then put your starting bid. Through the evening, bidders can place their bid and put their name next to their bid, and highest bidder wins the item.

Down the Left side of the Room will be the Garage Sale set up. For this, place a tag with your asking price and be prepared to be talked down in price. The Garage Sale side is first-come-first-purchased, so get to the room early, get your items added to the Garage Sale side and make sure you put your name on the item you are selling so that the buyer can chat and purchase your items.

I will bring scrap paper and pens for those who need to make their signs and price tags. Both sides of the room begin selling and bidding once items are set up for sale. All sales must be completed by 10pm or shortly after the meeting concludes. The plan is to end the meeting around 9:45pm so that all sales can be made

and we can vacate the room by 10pm. Remember to bring cash for your purchases.

For the December meeting, please bring a snack to share. Bottled water will be provided by PAS through the Snack Fund, and if you don't bring a snack, please provide a donation to the PAS Snack Fund. I'm attempting to raise funds through the snack fund to help pay for the Awards Ceremony pizza party in April 2020. All funds through the snack fund box will be accumulated and given to PAS by bank deposit the day after the April PAS Meeting, and after the case of water for the May meeting is purchased. So, if you have a little extra change on you, or you wish to help with the purchase of the pizza for the April Pizza party, please donate to the Snack Fund. Your donations are very much needed and appreciated.

And a quick reminder... if you have PAS Name Badges to pick up from me and you are current PAS Member, I will have your name badges at the December meeting. Would love to get them to you. If you ordered recently, I hope to have those name badges picked up and ready for the December meeting pending payment from those who ordered the name badges in November. Thank you all for your orders and we hope to see everyone for the December 5th PAS Meeting! David is one guest speaker you do not wish to miss!!!

What's Up For December?

By Don K. Boyd, PAStimes Editor

Name	Date	Rise	Set
Mercury	12-15-19	06:21	16:26
Venus	12-15-19	09:41	19:36
Mars	12-15-19	04:36	15:10
Jupiter	12-15-19	08:08	19:01
Saturn	12-15-19	09:16	19:17
Uranus	12-15-19	14:20	03:32
Neptune	12-15-19	12:16	23:46
Pluto	12-15-19	09:28	19:27

All Times Arizona Time

Bold means the object is "visible" in the evening

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December 15, 2019

Sunrise: 7:25

Sunset: 17:22



Q1: December 3



Full: December 11



Q3: December 18



New: December 25

Nov 7 PAS Meeting

(Continued from page 1)

mer. He told us of the story of how the books came about, and had a few for sale. Here's a link to his books on Amazon: [https://www.amazon.com/Finder-Charts-Bright-Telescopic-](https://www.amazon.com/Finder-Charts-Bright-Telescopic-https://tinyurl.com/tdwny5f)

<https://tinyurl.com/tdwny5f>

Brent has 5 Finder Chart books available on Amazon: "Finder Charts of The Messier Objects" which is a 2 volume set, "Finder Charts of Bright Telescope Objects" which is designed for a 6" telescope or larger, "Finder Charts of Overlooked Objects" and "Finder Charts of Select Double Stars." As the meeting concluded, I asked Brent if he would be interested in being a guest speaker for PAS, and doing a book sale and signing, and he said yes. We will look forward to his future presentation.

Then the floor went to Ted Blank who shared an upcoming Occultation Timing for which Ted was recruiting PAS Members to join in the fun to do. The Occultation happens the evening of Dec 28, 2019. It is part of the Lucy mission and if you are interested in helping with this Occultation or other events like this, please drop me an email and I will get you in touch with Ted

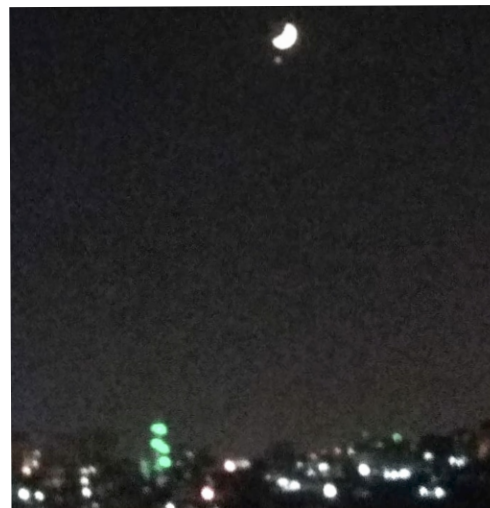
(my email is starstuff@gmail.com).

After Ted's mini presentation, we had upcoming events by me, as well as two raffles. The main PAS raffle won by a guest of PAS Randy Cranston. The second raffle, which was a gorgeous hard bound copy of a book from Lowell Observatory provided by guest speaker Kevin Schindler, was won by Mike Cawley, PAS member.

The club also did a vote, with the remaining PAS Members in attendance, and the vote was unanimous. Sam Insana announced the winner of the PAS Annual Astronomy Scholarship, James Arnold. James will be awarded the scholarship at the December meeting. Please attend to provide James with a warm welcome and a round of applause.

I wish to thank Sam for bringing the donuts, and everyone else who provided snacks, and I wish to thank those who donated to the snack fund as what remains when I'm done purchasing bottled water for the club meetings will go toward the Pizza Party at the April Awards Ceremony. I wish to also thank Kim Hollingworth for playing the part of PAS Hostess. Stu, our

Host was not at the meeting, and so I asked Kim to fill in. She was wonderful! Thank you Kim. And many, many thanks to all three of the wonderful Guest Speakers we had this night... Kevin Schindler, Brent Watson and Ted Blank. They were all wonderful, provided great info, and gave spectacular presentations for everyone to enjoy!



Close conjunction of crescent moon and Jupiter, with a view of Jerusalem, photographed by Bryna Lee Jacobson on October 31, 2019, using a Moto 7 cell phone

PAS First Annual Astronomy Scholarship

By Sam Insana, Vera Stiesmeyer
and Jenny Neujoy

The Phoenix Astronomical Society has awarded a \$500.00 astronomy scholarship to Paradise Valley Community College Astronomy Student James Arnold. He was one of five students who applied. The criteria was 1) Be enrolled in an Astronomy Class at PVCC, 2) Have a GPA of at least 3.0, and 3) Write a short essay answering why they are interested in Astronomy, have they participated in Astronomy events or activities, and do they see a future in Astronomy.

James is enrolled in an Astronomy class this semester, at PVCC. He has a 3.4 GPA. Throughout his life he has participated in astronomy events. His parents took him to star parties in dark sky regions all over the US. He recently attended the

Grand Canyon star party. James has done stargazing hands-on with telescopes since the 8th grade. He and his family also view meteor showers. James has read numerous astronomy books and looked at Hubble images. While he is majoring in Journalism and Mass Communications, James realizes the importance of astronomy to explain what we are and where we fit into the universe. He feels we need to keep developing our technologies and move forward with NASA and Space X and other facilities. He feels that astronomy is necessary for humans to survive in the future.

The PAS scholarship committee consisted of Jenny Neujoy, a PAS Board of Director and Astronomy Professor at PVCC, Vera Stiesmeyer, a member of PAS and an attorney with much experience in

awarding scholarships to Maricopa County Community College students, and Sam Insana, a member of PAS and former PAS president. They drew up documents, were in contact with PVCC officials like Jessi Wright and Paul Gonzales, reviewed the five applications and independently awarded points to each applicant. James received the highest point total awarded by each of the three scholarship committee members, so the award was unanimous.

This was the first time in the 71 year history of our organization that PAS has awarded a scholarship. As a non-profit organization, it is indeed fitting to do so and hopefully this will be an annual event. Many thanks to the members of PAS who voted to do this project and use part of the PAS treasury for such a worthwhile cause.

Pinnacle Peak Park Star Party Oct 4

By Mark Johnston, Solar System Ambassador

Friday October 4th, I led a star party at Pinnacle Peak Park. We had 23 in attendance and had fabulous views of the Moon, Jupiter, Saturn, Neptune, Uranus, NGC

6888, NGC6992, Eta Cas, Gamma Andromeda, M8, M57, M31, M13, M27 and the Coathanger asterism (Brocchi's cluster). The night vision really helped with

seeing nebula given the bright Moon. The president of the Arizona Audubon Society was there and he really enjoyed it. Lots of positive comments from the group.

Black Mountain Campus Star Party Oct 24

By Sam Insana a Past PAS President and
RSVP for the night.

The October 24th BMC star party seemed to have beautiful weather with temperatures in the 70's, no rain and no clouds. Unfortunately, there was a lot of wind 10 to 20 mph. This made the seeing poor. We parked our cars on the observation deck to help shield the telescopes from most of the wind, but the upper atmosphere was still turbulent. Although Jupiter and Saturn were visible and usually showpieces, they were mostly blobs of shimmering whiteness in the telescopes. Once in a while you could barely make out Jupiter's cloud bands and Saturn's rings with low power. Other objects like double stars were also difficult to see. However, the Andromeda Galaxy, the Pleiades Open cluster, and the M57 Ring Nebula and other objects looked good. Ray Adams, Mark Johnston, Don Boyd and Sam Insana had telescopes. Ron Walker, Bob Ewing, Cal Vance and Paul Facuna assisted with talking astronomy with the guests and helping vehicles on and off the observation deck.

Mike Marron, our PAS President, drove in from an exhausting trip to Texas, and was inside the Aquila building presenting his

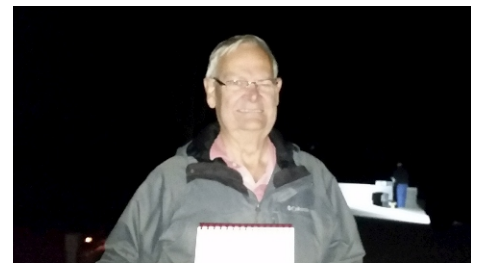
meteorites. Jenny was unable to open the large domed observatory since she was home battling bronchitis. About 40 guests attended, less than expected, but others probably were concerned with the winds.

A special treat was the appearance of a gentleman from Salt Lake, Utah, Brent Watson. He attended as a guest for the first time. He hand built several telescopes over the years and was a good friend of John Dobson, the famous sidewalk astronomer and developer of the Dobsonian telescope. I had several star guide books on my table that I use to help me star hop with my telrad finder scope. Brent picked up one of the books and informed me that he is the author. He pointed out a beautiful hexagonal object called the Fairy Ring which he said was on page 21 of one of his books called Overlooked Objects. It was fantastic showing 6 double stars in a ring which I managed to see in my 8 inch Newtonian looking in Cygnus the Swan. This last observation was at 9 pm, the end of the star party, which according to Murphy's Law, is also when the winds finally died down. Brent may come to our Nov 7th PAS meeting. A new PAS member, Richard, who

signed up at the PAS telescope workshop a week earlier, attended to discuss astrophotography with Ray Adams.

Hopefully the next BMC star party on November 21st will have great weather and seeing and more PAS telescopes.

Mark Johnston adds: Conditions were about the worst for seeing I've ever seen. Maybe a 1.5 out of 5. Planets were boiling blobs, easy double star splits were impossible. Very windy. Restricted to showing low power views of star clusters and nebulae. Had a modest turnout but some very enthusiastic participants.



This is Brent Watson holding up one of his star finder books. Brent was seen at the Oct 24 BMC star party hanging out with Sam Insana who provided this photo.

Tonto Star Party Aug 19

By Sam Insana, PAS Member

August 19th, was a beautiful night for stargazing. There was no moon, no clouds, no wind, rain or dust, low humidity and temps in the low 90's. Very lucky for the Monsoon season. The event was held about 15 miles NE of Fountain Hills, along the 4 Peaks Forest Road, in a place called the Cookout area. It was organized by Stellar Adventures, an Arizona Tour group that hires PAS Star Tour members to provide star parties. There were 4 guests from Chicago,

who hadn't seen the Milky Way in years. They loved the night. I was able to show them M31 Andromeda Galaxy, Gamma Andromeda blue and gold double star, Albireo Double star, Mizar double star, M8 Lagoon Nebula, M57 Ring Nebula, M81 and M82 Galaxies, M13 Hercules Globular Cluster, Jupiter, and Saturn. The star party was scheduled for one hour, but we were out there looking for almost two hours since it was so pleasant and they kept wanting to see more. I took a Bortle reading of 3.9 which is dark

enough to make the Milky Way look very good. The Moon came up about 90 minutes after we started and they wanted to see it so we remained long enough to see some good looking craters with central mountain peaks. We also saw a few Perseid meteors. The 4 guests, 2 elderly and 2 middle-aged, were very well educated in science and eager to learn more. I answered many questions about Astronomy, telescope and binocular viewing, astrophotography, occultation timings, spectroscopy, meteors, etc.... Great night!!!

PVCC Telescope Workshop Sept 12

Terri, Event Manager

Attending this event from PAS was William and Terri Finch, Mark Johnston, Rick Cunningham, Cal Vance, Stu Brackney and Will Kalif. Many thanks to my telescope team. They were wonderful at this event!

We had 7 RSVP's from the public and 2 from Meet Up. However, only 4 RSVP's showed up plus one walk-in. We did have a full house but I don't know what happened to the others who wanted to attend and didn't.

I wish to thank Ashley Beach for at-

tending. She, along with Jack and Margaret Trimble from Gold Canyon, Natalie Harbecke, and Eric Williams joined Stu, Will, Cal, William and Me at the table to discuss what telescope is best to purchase based on their needs. We started the discussion about 7:30pm and concluded it about 8:30pm. I wish to thank William and Cal for their input, fantastic stories, advice, and information.

While I was doing the "What To Purchase" part of this event, Mark and Rick were helping Lynn with her telescope in-

doors and outside. Then Cal set up his telescope outdoors and showed the Moon, Saturn and Jupiter to everyone who stuck around to view with us. The sky was perfectly clear on this night and the temperature outdoors was beautiful. The event concluded by about 9:30pm and we packed up.

I wish to congratulate Eric Williams for becoming a new member of PAS! If you missed this Telescope Workshop and would like to attend one of the next ones, here are the dates: Oct 17 2019, Nov 14 2019, and Dec 12 2019. Hope to see you there!

Tips From a Telescope Nerd - The All Arizona Star Party

By Will Kalif

The All Arizona Star Party is a weekend event that occurs every October on the weekend nearest the new moon. It is hosted by Arizona astronomy clubs and it is unique in the world of star parties. The Telescope Nerd attended the last event which was on the weekend of October 25th - 27th, 2019.

When it comes to pursuing amateur astronomy, the hobbyist faces a conundrum. He or she can go to astronomy club meetings which are a great way to meet other amateurs and learn about the hobby through presentations and guest speakers. But you don't get any actual telescope experience at a club meeting.

Or you can go to a star party where you can see and use a variety of telescopes. But at a star party it is difficult to network and mingle with other people because everyone is literally roaming around in the dark!

So, in order to improve yourself in the hobby you have to do both - go to star parties and go to club meetings. And this is great. It is what I do. But, the unique thing about the All Arizona star party is that it gives you the absolute best of both worlds because it is a weekend-long event that spans both the days and the nights.

During the day you can sit around the welcome tent and chat with other amateurs. You can also walk around the site and see the various astronomical instruments that

they own and use. And then at night you can avail yourself of some excellent dark skies that are well away from city lights. And you can set up your telescope once on the first night and leave it set up for the whole weekend which is very convenient.

If you are an amateur astronomer that loves the hobby and science of astronomy this is an event you really want to attend. It is something unique in an already very vibrant astronomy community in Arizona which is undoubtedly among the best in America. Schedule it in next year for the weekend in October closest to the new moon.

About the event.

It takes place on an abandoned air-field about 90 miles west of Phoenix and it is a straight drive west along Route 10. Once you exit off the highway you drive about another five miles on a dirt road to arrive at the air-field.

The vast majority of astronomers that attend this event do so

with some kind of overnight accommodations like a camper, trailer, or tent. And they stay the full weekend. The site has plenty of room for recreational vehicles to park liberal distances from each other. There are portable restrooms and a welcome tent which is terrific. It is where people meet to talk about astronomy and it is stocked with refreshments and food which includes hot beverages during the nights.

I took the accompanying photo at the All Arizona star party. It shows the Milky Way over one of the astronomers. And the telling thing about the photo is that it gives you a good idea of how dark the sky was there. The Milky Way extends just about to the horizon, with very little city glow on the horizon.



A beautiful dark sky scene of the All Arizona Star Party on Oct 23, 2019 taken by Will Kalif.

My Night at Hovatter Airstrip Oct 26

By Mike Cawley, PAS Member

Three years ago, I bought my first telescope. Gazing out from my back-yard, I discovered the varied terrain of the Moon, rings of Saturn, the Great Red Spot of Jupiter and the polar ice caps of Mars. Since my scope was not a go-to type, I learned how to star hop to find the various deep-sky wonders such as the Messiers and the brighter NGC objects. But it was tough going. The growing sky pollution from the Valley made it hard to find objects.

It was hard to star hop when there were only about 20 or so target stars on which to base my reckoning. The setting circles on my scope made it a little easier, but often I would scan right past my target due to the sky glow.

Joining PAS made some darker sites

available for observation and I could start to see some of the glamour promised by the many descriptions I read about in astronomy books of the various deep sky objects. Depending on which way you looked, you could be rewarded with a stunning contrasting view of the Bode galaxies or a dull milky display of M22 robbed of all its beauty. There was no escaping the yellow-

ish glow from the city that always loomed



Here's a couple of SCT telescopes. Photo by Mike.

over about a third of the sky or more depending on where you were observing. I

often traveled to the far outskirts of the Valley down by the San Tan Mountains to get good looks at a lot of the southern sky objects. But it still was a compromise depending on where I was looking and how much haze reflected the city glow.

Faced with this constant distraction, I made plans to try to get to a site that would allow a full sky experience akin to that of a planetarium.

On October 26, 2019, I attended the All Arizona Star party at the Hovatter Airfield. While this was a primitive area, Porta-Potties were provided, and a great taco dinner and astronomy-related raffle only added to my excitement as to how the slowly darkening cloud-free sky would look after sunset. Before it got dark, I took the opportunity to look around at all the hardware fellow astronomers hauled out. You say you want variety? Scopes ranged from camera-toting refractors, SCTs of various sizes, at least one Newtonian Astrograph on a GEM mount to some really big Dobbs. Apertures ranged from 3" up to 24". I took the time to ask around about the gear and all observers were more than gracious to answer my questions. As it was getting dark, I rushed back to set up my new-to-me Dob telescope and waited for the curtain of nightfall.

As usual, the planets were the first up. I briefly looked at them, but they're easy targets at home and look fine in my backyard. Since my new scope had digital setting circles, I had made a list of Fall objects and some Summer stuff that had eluded me over the months and years.

The ever-growing darkness slowly revealed stars everywhere. I started scanning around with binoculars and noted dozens of large star clusters, asterisms, and the big galaxy M31. The sky was just lovely! M31 was visible with averted vision along with the Double Cluster.

Swinging the binocs around, I noted another gray spot in the sky. Turned out to be M33! That one is impossible from my backyard. After drinking in the views for awhile with the binos, I turned to the scope and started going through my list. That turned out to be a futile effort. I kept getting

distracted by the simply stunning views of the bright Messier objects. Remember M22 from my backyard?

No contest! Stripped of the milky city skyglow, the globular was just radiant against a curtain of random stars in the

background. You can't get a 3D effect from a one-eyed telescope view and yet the cluster seemed to float in front of that background of stars. The interior of the cluster had a beautiful ember-like glow from within the core.

But enough of the bright stuff. I was after nebula! Slipping an oxygen 3 filter over a 41mm eyepiece revealed dozens of stellar clouds all around the sky that are practically invisible from the city.

Despite them being low on the southwest horizon, I was treated to some revealing views of the Lagoon, Swan and Eagle nebulas. All easy to see and easy to pick out the feathery strands of gas and dust that are either obscured by or rendered dull and bland by city lights. Another surprise was waiting in Cassiopeia, Pacman! The dust lane that gives this nebula its nickname was easily visible as was the nebula itself. A first for me. The highlight of the night, though, turned out to be something that is just barely visible with averted vision in my new scope with filtration in the city. I had almost forgotten about it. The Helix Nebula was truly haunting with the 2-toned circles that stared at me through the eyepiece. Averted vision revealed the brighter strands crossing between the two clouds of gas.

Made my night.

The airstrip is about 100 miles west from downtown Phoenix and, although the glow is still visible, it doesn't protrude more than about 10 degrees above the horizon. Glow from what I think is Quartzsite directly west and possibly Yuma to the southwest are the only other bright spots. But the sky over the local meridian is free of any horizon city glow. At one point, the Milky Way stretched from horizon to horizon. Under these conditions, every scope will reveal celestial treats. I could spend hours just cruising through the sky with a pair of binos. Indeed, some targets are so large that binos are all you need.

If you ever hear of a group of astronomers planning to go out there for a night of observing (I wouldn't do it alone), don't pass it up. It's well worth the trip!

Another popular spot for Valley Clubs is a site called the Antennas, now dedicated to Steve Coe. It's about 1 mile west from the airstrip and should offer the same stunning nighttime skies.



This is the Big Dob telescope. Photo by Mike Cawley, PAS Member.



A nice Refractor. Photo by Mike.



And just in case you are hungry at this event, here's the Taco Tent. Photo provided by Mike Cawley.

Park After Dark at Tonto National Monument

Free Events for Everyone!!!

By Terri, PAS Event Manager

Christa Sadler, Park Guide/Volunteer Coordinator, and I have set up a couple of really nice Star Parties for all ages at Tonto National Monument. The two star parties are listed here with more details provided at the links included in this article. But wait, there's more.... Besides the two upcoming star parties, there are many more free-to-

attend events at Tonto National Monument, listed in the flier on this page. Please always RSVP where and when asked, just in case weather or other stuff cancels the event. We hope you can enjoy these many events in Fall 2019 and Spring 2020.

Jan 25

<http://www.pasaz.org/forums/calendar.php?do=getinfo&c=3029&day=2020-1-25&c=1>

Apr 25:

<http://www.pasaz.org/forums/calendar.php?do=getinfo&c=3030&day=2020-4-25&c=1>

Here's the link to the Flier in the downloads section of the PAS website, which has many other events you can attend for free at Tonto National Monument:

<http://www.pasaz.org/forums/downloads.php?do=file&id=299>

Tonto National Park Star Party Sept 19

By Terri Finch, Event Manager

The evening began with Storm Moon coming to my home to join me in doing this event. We left my house about 5pm. Since it was our first time doing this event, we decided to leave with plenty of time to find the set-up location. We drove out to Tonto National Park and when we got on the bumpy, lumpy dirt road, we took it at about 1-5 mph. It took us 35 minutes to get from Hwy 87 to the set-up location. Once there, it was about 7pm. Set-up time was agreed to be 7:30pm and the event for ten people plus the Hummer driver was agreed to be 8:30pm to 9:30pm, however, Storm and I found one last object right at 9:30pm and so we stayed until 9:50pm. Then the Hummer Driver, Ken, took the group back to their hotel. When we drove home, we got back to my home about 12:45am. That was one long night, but let me tell you how wonderful it was!

We had set up my telescope, Doctor Who. And until the Hummer arrived, we were experimenting with finding objects so that I wouldn't be rushed to figure out where the objects were, as I was doing the finding of the objects totally manually. So, I found and aligned my telescope to Jupiter, and then to the North Star. Then we went back to Jupiter to look to see how many of Jupiter's moons were available on this night, and there were three moons visible. Then we went over to Saturn, just to take a peek. We were also treated to the ISS fly-

over. The hummer hadn't arrived with the attendees yet, so I took a quick look to see if I could find the E.T. - and notice which way he was oriented, and Andromeda. About this time, it was 8:30pm and the group arrived. Storm and I started on Jupiter, as it was going to set first. After talking about Jupiter for a while, I moved the telescope to Saturn. This time we got a few "Wow's" from the group. Then I took about ten minutes to give a night sky tour and we talked about constellations, asterisms, some sky lore, and anything else I felt it would be good to share with the group. The ten people attending all looked at Jupiter and Saturn, and the sky tour, then lost interest and were more interested in chatting among themselves.

To draw them back in, I put the scope on the Andromeda Galaxy, then Perseus Double Cluster and then E.T. By now, only about five of the ten attendees were looking through my scope. The Hummer driver, Ken, was very interested in what I was showing.

I then made an attempt to find Hercules Globular Cluster, failed, and put my telescope on the Ring Nebula. When I saw that the group wasn't interested in the Ring Nebula, except for Ken and one other gentleman from Mexico City, I attempted to find Hercules and this time I found it, and with enthusiasm I got the group to look at Hercules Globular Cluster before climbing

back into the Hummer to be transported home. That was 7 objects, for 10 + 1 people, in about 1 hour and 15 minutes of time. The hummer left and it was so dark, so beautiful, the temperature that night was a dream, a slight breeze, and I couldn't have asked for a nicer night to do this event. So, Storm and I looked for the Cat's Eye Nebula and found it. We discussed finding Uranus but didn't because the 3rd Quarter Moon started rising and wiped out the area Uranus was hanging out in. So, I gave up on Uranus, and put the scope on the Moon which was absolutely gorgeous this night! Then we packed up and drove home.

I wish to thank Ken for really helping make the night awesome. He kept the group busy talking while I found the next object, plus supplied cold bottled water to them as needed, and was a dream to do this event with. I also need to thank Storm who drove to and from the event, helped with set-up, talked about the objects, helped me find some of them, and was just a great part of this event. I also wish to thank Natalie, my contact at Stellar Adventures, who helped me locate where we were setting up since this was my first trip out to this location and there wasn't much in the way of markers to know how far to drive on the dirt road to get to the set up location. It was a super wonderful night with great people and the most fantastic view of the night sky in a long time!

**Tonto National Monument and Tonto National Park
are 2 different locations PAS provides star parties.**

Gilbert Library Lecture Oct 14

By Mark Johnston, PAS Member

I did a talk at the Gilbert Library tonight. Had a small turnout due to Columbus

day (people thought the library was closed) but the guests were very attentive and enthusiastic, lots of Q&A at the end. The

librarian was appreciative and wants me to come back early in the new year for another event.



The Orion Nebula: Window Into a Stellar

By David Prosper

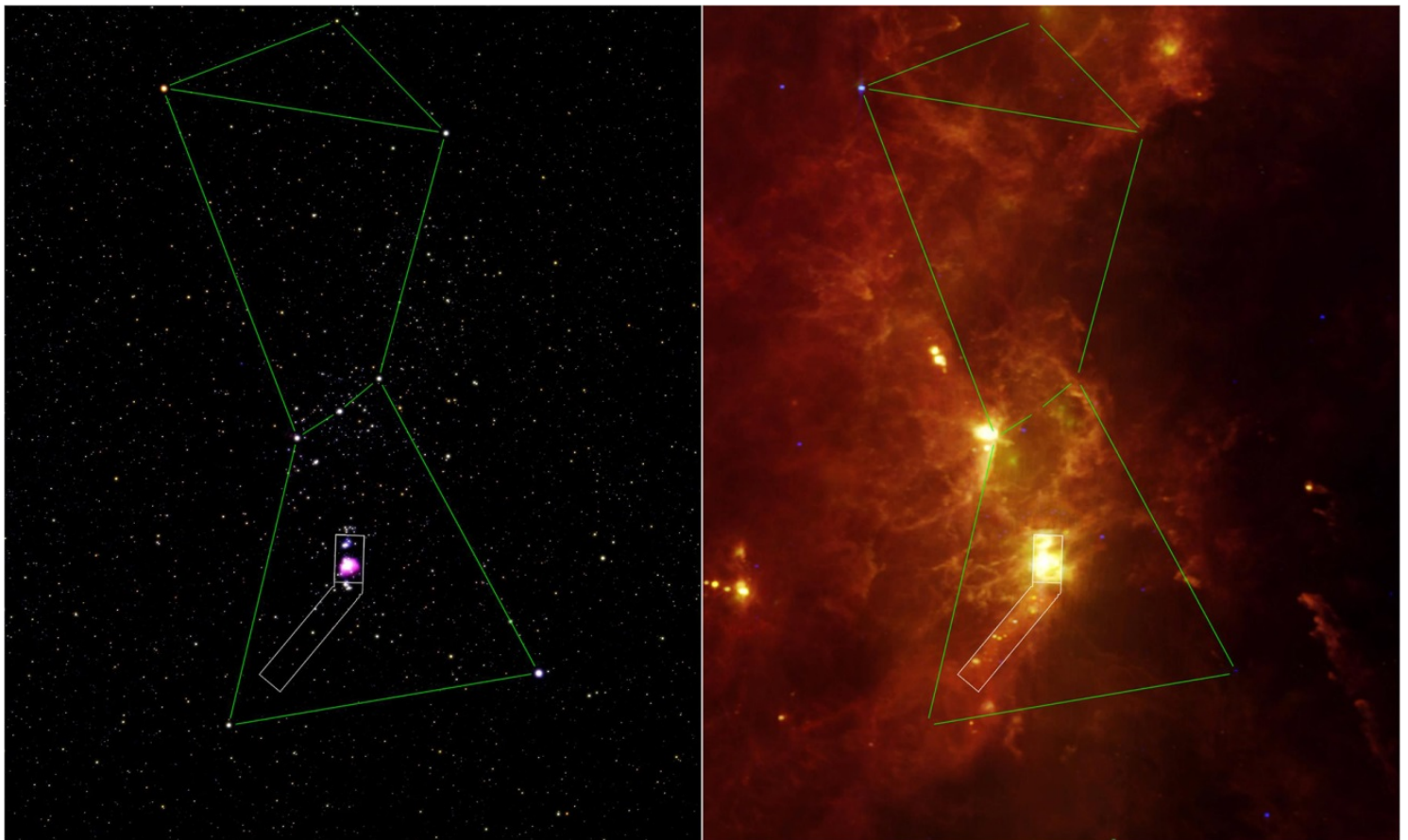
Winter begins in December for observers in the Northern Hemisphere, bringing cold nights and the return of one of the most famous constellations to our early evening skies: Orion the Hunter!

Orion is a striking pattern of stars and is one of the few constellations whose pattern is repeated almost unchanged in the star stories of cultures around the world. Below the three bright stars of Orion's Belt lies his sword, where you can find the famous Orion Nebula, also known as M42. The nebula is visible to our unaided eyes in even moderately light-polluted skies as a fuzzy "star" in the middle of Orion's Sword. M42 is about 20 light years across, which helps with its visibility since it's roughly 1,344 light years away! Baby stars, including the famous "Trapezium" cluster, are found inside the nebula's whirling gas clouds. These gas clouds also hide "protostars" from view: objects in the process of becoming stars, but that have not yet achieved fusion at their core.

The Orion Nebula is a small window into a vastly larger area of star formation centered around the constellation of Orion itself. NASA's Great Observatories, space telescopes like Hubble, Spitzer, Compton, and Chandra, studied this area in wavelengths we can't see with our earthbound eyes, revealing the entire constellation alight with star birth, not just the comparatively tiny area of the nebula. Why then can we only see the nebula? M42 contains hot young stars whose stellar winds blew away their cocoons of gas after their "birth," the moment when they begin to fuse hydrogen into helium. Those gas clouds, which block visible light, were cleared away just enough to give us a peek inside at these young stars. The rest of the complex remains hidden to human eyes, but not to advanced space-based telescopes.

We put telescopes in orbit to get above the interference of our atmosphere, which absorbs many wavelengths of light. Infrared space telescopes, such as Spitzer and the upcoming James Webb Space Telescope, detect longer wavelengths of light that allow them to see through the dust clouds in Orion, revealing hidden stars and cloud structures. It's similar to the infrared goggles firefighters wear to see through smoke from burning buildings and wildfires.

Learn more about how astronomers combine observations made at different wavelengths with the Night Sky Network activity, "The Universe in a Different Light," downloadable from bit.ly/different-light-nsn. You can find more stunning science and images from NASA's Great Observatories at nasa.gov.



This image from NASA's Spitzer missions shows Orion in a different light – quite literally! Note the small outline of the Orion Nebula region in the visible light image on the left, versus the massive amount of activity shown in the infrared image of the same region on the right. Image Credit: NASA/JPL-Caltech/IRAS/H. McCallon. From bit.ly/SpitzerOrion

Desert Botanical Garden

Luminaria December 2018

By Various Attendees of this event -
Review 6 of 6

As we close out this year with the conclusion of the 2018 Luminaria event at DBG in reviews, we look forward to a new year of fun, family-friendly, free events with PAS in 2020. Part 1 of this review can be found in the February 2019 Newsletter issue on pages 2 & 3, Part 2 is in the March issue on page 4, Part 3 is in the April issue on page 4, Part 4 is in the October issue on page , and Part 5 is in the November issue on page 6. This review is the conclusion of the DBG 2018 Luminaria event.

Las Noches de las Luminarias of December 2018 at the Desert Botanical Garden (DBG) had the PAS telescope team of 4 telescopes and 1 presenter each clear night, with variations on cloudy nights that consisted of these wonderful Lumi Team members: Pete Turner, Mark Johnston, Rick Cunningham, Roger Anzini, Ted Blank, Mike Marron, Bruce Wurst, Don Boyd, Sam Insana, Storm Moon, William Finch, and Terri Finch, with additional help from Vera Stiesmeyer, Ofelia Waters and Jake Von Ruhr.

Dec 28 Friday, Terri writes: With only a few days left of the Lumi event, many of my telescope team were hoping for clear skies to the end of the year. As of this morning, forecasts say clear skies Fri, Sat and Sun, with near or below freezing temperatures during the event. The goal is 4 telescopes and 1 presenter for each of these nights. When leaving DBG this night it was 39 degrees. That's really cold to be outdoors doing this event.

Dec 29 Saturday: We had a change in attendance from some of the telescope team members due to them catching a terrible cold but we did provide 4 telescopes and 1 presenter for this chilly night.

I was sharing the Orion Nebula with some patrons and I mentioned that the Orion Nebula is a stellar nursery. I said something like "You are seeing the baby stars as they were 1,500 years ago." One gentleman says to me "How do you know they are baby stars?" and the friend of his standing next to him says back to the both of us, "Don't you hear the babies crying?"

Dec 30 Sunday: Tonight we had 4 telescopes and 1 presenter and the skies were mostly clear with a little clouds. There

was an annoying Phoenix city light pollution glow to the north that kept washing out some of our objects as it became thicker through the night. The temperature at pack up was 36 degrees.

On this night, Roger and I decided to team up on Orion Nebula. Roger was set up at the Sonoran Desert Garden Sign location and I was at the Water Tower Overlook. I was showing a wide angle view through my 8" scope of the Orion Nebula with my Nebula Filter which enhances the nebulosity. Roger showed a close up view of the Nebula and the Trapezium (the 4 baby stars in the center of the nebula), and he had a different nebula filter on his 16" scope. At the beginning of the event, I told the patrons who stopped by my scope the plan of doing this later in the evening, around 8:30pm. The plan being that Roger was going to show a zoomed in view of the Orion Nebula and that I suggested that they swing by Roger's scope and then my scope, after 8:30pm, and do a comparison of the view through the two scopes. I did a mini-count of who was doing this, and around 8pm, Roger focused on Orion, so i started getting people at my scope who said to me "Is this the same Orion as the big scope has?" And, of course, I would say back to them... "Yes, but you want to compare the two views between a 16" scope with one kind of Nebula filter, and an 8" scope with a different kind of Nebula filter." They would then look through my scope and I'd ask them to tell me what was different about the views. I had some very interesting observations shared with me.

Also on this night, I mentioned that Orion had baby stars and one of the little girls started singing "Baby stars do do do do baby stars do do do..." "After she left my scope, I mentioned the baby stars and sang the song for the patrons. Most of the moms who had children with them, giggled and said they know that song as "Baby Shark," and they enjoyed hearing it. Other patrons just looked at me funny like they never heard the song before. They also didn't have children with them at this event. That's what PAS does - educate and entertain the patrons at an event such as the DBG Luminaria of December 2019.

Dec 31: Monday was a Rain Out. It started with trying to decide who to send to DBG for this event because the weather

reports, of the six sites I checked for the day, were mixed as to what the evening was going to be like. So, originally I was sending 2 presenters and 2 or 3 telescopes, but then it was trimmed down to 2 presenters and 2 telescopes. When Susan (the boss over my Lumi Telescope Team) got to her office, she had quite a collection of disagreeing weather reports to sift through, so she called me and I told her what I saw. I saw a chance of rain, but mostly total cloud cover and suggested at that time, about 12:30pm, to have only 2 presenters but because it was the last day of the event, I suggested having 1 or 2 telescopes on display, even though there would be nothing visible in the sky that night. She agreed and we I arranged for 2 telescopes and 2 presenters. Then, the weather shifted and it looked worse, and I told her there was a higher chance of rain, so together, we decided to have no telescopes, and I told my 2 telescopes to cancel their trip to DBG. This was done by 2pm. Then, at 3:30pm, I checked the weather, saw rain coming, told Susan, and she canceled one of the two presenters for the night. Mike and Ofelia went down to DBG to be there, under a canopy. About 5:30pm, the start of the Lumi event, the rain hit. Mike and Ofelia made their escape and went home. I contacted Susan to ask how things were around 7pm and she said the whole event was cancelled and everyone went home. That was a fast moving rain storm. So, Dec 31, New Year's Eve, my team was able to stay at home, in a warm, cozy house, enjoying something other than freezing temperatures down at the Luminaria event. That wasn't the best way to end the year, but it was interesting.

PAS hopes to do this event next year, for December 2019. Wishing everyone a Happy New Year and a big thanks to all who visited the telescopes during the 27 of the 29 days of the 2018 Luminaria event. We had a lot of clouds this year, but only 2 very rainy days that cancelled the whole event. I wish to thank DBG for having PAS at this wonderful event. It is a great way to enjoy the holidays especially since this year had 9 music bands, 7 Electric Desert displays, and most of the nights, 4 telescopes and 1 presenter. It was a great success and lots of fun. Thanks to all who were involved in this event to make it a fantastic

time for everyone!

If you missed the 2018 Luminaria event at DBG, please, enjoy 2019. DBG has the most interesting, fun event for the whole family every December. You don't want to miss it! Happy 2019 Holidays to everyone! PAS will be at the December 2019 DBG Luminaria on Nov 29 & 30, Dec 6, 7, 8, 13, 14, 15, 17, 18, 19, 20, 21, 22, 23, 26, 27, 28, 29, 30 & 31 weather permitting. Looking forward to seeing you there!

The DBG Luminaria of December 2016 review can be found at this link: <http://www.pasaz.org/forums/downloads.php?do=file&id=292> for your reading enjoyment.



(Left to Right) Terri's scope, Jake, Storm & Storm's scope ready for the Lumi event of Dec 1, 2018 set up in the Wildflower Garden at the Water Tower Overlook. Photo taken by Terri.



Bruce Wurst and his telescope waiting for guests to arrive on Dec 21, 2018 at the Desert Botanical Gardens Luminaria event. Photo taken by William.



Sam Insana set up at the Dec 2, 2018 Lumi event with his very interesting, vast collection of Meteorites on display. Photo taken by William Finch.

Star Party NE of Fountain Hills Oct 6

By Sam Insana, PAS Member

Sunday night, October 6th, I was asked by Stellar Adventures to show the night sky at the cookout area on the Four Peaks Forest Road about 16 miles NE of Fountain Hills. It was a beautiful night with no wind or clouds, but there was a 60% moon and some RVs with brights lights on. I had never encountered RVs in that area before. Ordinarily this area has a Bortle reading of 3.9, making the Milky Way look awesome. Unfortunately because of the moon and the RV lights, the Milky Way couldn't be seen. However, I did show a dozen fairly bright objects with my 8 inch Newtonian reflector

to the 2 customers from Maryland: Jupiter, Saturn, Andromeda Galaxy, Gamma Andromeda double star, Mizar Double star, M57 Ring Nebula, M13 Hercules Globular Cluster, M45 Pleiades Open Cluster, Arcturus Red Orange giant star, Vega white star, M52 Open Cluster, and lastly the Moon with its terminator creating shadows on the craters and mountains. It was supposed to be a one hour event but they didn't want to leave so I stayed an extra 15 minutes answering astronomy questions and pointing out constellations with my green laser.

Ken, the man who drove the 2 people to the cookout area, said we can park West of the cookout area in a depression, to avoid high winds or blinding lights from the RVs. It still wouldn't help with the moonlight, but it is good to know. Also, the road to the depression has a lot of deep craters and rocks so you have to drive very slowly and carefully.

On my way home that night, a large great horned owl flew in front of my windshield from one side of the four peaks forest road to the other. A magnificent way to end the night.

Hidden Hills Elementary Star Party May 8

By Terri, Event Manager

Joy Rea, the most awesome teacher at this school, invited PAS to do a star party for her school originally on Apr 8th. The weather was not cooperative and so we moved the star party to May 8th. Again, the weather didn't seem like it was going to be cooperative, and really it wasn't, but we held the star party and it was mostly a success. Many thanks to Joy for having PAS at her school for this event and providing the pizza and chocolates for the Telescope Team.

The PAS Telescope Team that attended this event was Roger Anzini who brought his 16" Telescope, Terri and William Finch who brought an 8" telescope and really awesome Space Place Bookmarks for all attendees, plus we had Storm Moon with her 8" scope, Sam Insana had his Meteorites on display, along with Pete Turner and his 12" scope and Rick Cunningham attended with his 8" scope.

Storm, William and I were at our house as we loaded the two telescopes and needed items into my SUV and during this time the clouds were dropping heavy, cold, large rain drops at a 45 degree angle onto us. Yes, it was raining at the time we loaded our equipment into the vehicle. After loading, we went into the kitchen to have a drink and wait for the rain to stop falling. We could hear it beating down on the roof of the house. My right side, where the rain was hitting me as I loaded the SUV was soaked by the time we went indoors. When the rain stopped, we took off in two vehicles to the school.

William, Storm and I, followed by Roger, all arrived at the school about 5:30pm and waited as the custodian came to open the gates to let us in. We chatted with Joy for a bit while we waited for the gates to let us through, and then we started setting up. The Telescope Team was set up and enjoying pizza provided by Joy, and a treat of cream soda provided by Roger before 7pm.

During set up, it rained again. It was a light rain, but cold, and continuous, so those of us who were brave, set up our scopes and covered them with plastic. Storm and I covered our eyepieces and other items on the table we shared. Roger assembled his scope and covered it with a shiny silver blanket. Rick started to set up, felt it begin to rain and left his items under cover in a wagon, and then Pete arrived

about the same time as the rain, and waited for the rain to stop before he set up, but also had his equipment under a Grill Cover - this was a great idea.

We ate during the rain and the basketball court had puddles of water. We enjoyed a nice rainbow but didn't like how the temperature dropped and the wind increased. Luckily, the forecasts we saw said it would be better after 7pm, but that wasn't totally true.

So, 7:20pm we started the star party. We stayed set up, without any additional rain falling but tons of thick black clouds loomed over us till 8:30pm when Joy said we could pack up and head home. Most of the scopes were on the sliver of a Moon. The Moon was in my scope as Red first, then I did Purple, then I decided to align my scope as I found the North Star through the clouds with William's help. Then I showed Arcturus. Why? Because one boy asked me, and his mom was intrigued by this as well, to show him a star. I told him the normal. That stars look the same in the scope as they do to the naked eye, which is a pin prick of light. But, since Arcturus was visible and I know a little about Arcturus from listening to Roger at DBG, I put my scope on Arcturus and included a nearby white star. Then I showed the boy and his mom the two stars and talked about why Arcturus was so bright, red, and a larger disk than the much farther away white star in the field of view. They loved it, and I also shared what I knew about Arcturus. Roger heard what I was saying and added a few more interesting facts about Arcturus and about that time, Joy walked over, thanked us for coming and told us to pack up.

Storm was able to show Mars for most of the evening on and off, while the clouds hid Mars and then let Mars be seen again, much like my Moon. It was a more exhausting evening than if there were no clouds in the sky to get in the way of showing the objects we love to show. But everyone enjoyed the event and the views we could provide.

Many thanks to my telescope team for staying at the event even in the rain, and through the beautiful rainbow and super cloudy skies. And many thanks to Roger for helping me set up this event. We had a great time, wonderful people attending, and an awesome teacher to work with to make this event a success. Hope to do this event

again in the future, without the rain and clouds and rescheduling.

Roger adds: The telescope team at PAS loves it when we are asked to bring our scopes to schools. Our first Hidden Hills star party last year was such a smashing success they wanted us back again in 2019.

Our guide and mission director in this project is the unstoppable, unflappable science teacher at Hidden Hills, Mrs. Joy Rea.

After weather forced us to cancel a planned stardate in March, a new date of May 8th was carefully crafted from the dwindling few days of school that remained before the days of summer were upon us.

So, along came a beautiful yellow May 8th morning and a matching afternoon, all agreed it was a big fat GO for the show.

Suddenly, about 4 PM, out of that beautiful yellow afternoon came a black line of thunder showers marching across North Phoenix. Wait, What, North Phoenix? That's where the Hidden Hills star show was planned for tonight! Some team members were already rolling in that direction with telescopes in tow. Thunder popped, lightning flashed and cell phones rang in panic, quickly buzzing tower to tower across the Valley. Oh my, would we call this off, should we turn back for home and hide under the beds?

I instantly called Joy Rea at mission control.....a calm voice answeredone moment please, "Hi Roger, what's up?" "Ah, thunder and lightning, that's what's up, what are we to do?"

Joy exclaims, "Hey, I put too much effort into this thing to quit now. I want you guys here no matter what. We are going to sit down, eat pizza, enjoy each other and savor whatever adventure the evening serves up to us. So please be here!"

So, per Joy's request, the whole telescope team arrived. Sam set up his extensive meteor collection under the safety of the ramada. Between the raindrops Terri, Storm, Pete, Rick, and I quickly unpacked our scopes with assistance from William, covered them and retreated to join Sam under the shelter of the ramada for pizza and soda.

The rains came again, kids and parents gathered daring the weather to continue, suddenly the crystal blue began to grow from a small seed, to skies that promised stars and even a 20% moon. From no-

where, more students gathered, excited to be near the telescopes and watching the moon dance among occasional clouds that drifted on winds aloft. Stars quickly followed as true darkness fell around us. An evening of stars, moon and beautiful clouds

was enjoyed by everyone attending. We all owe the success of this wonderful evening adventure to Hidden Hills science teacher, Joy Rea. Thank



Storm Moon is seen checking the weather while it drizzles over the equipment hidden under plastic. On the left is Storm's scope and under the blue tarp is the table she and I share for the telescope accessories. In the background, a sunset is forming. Photo by Terri.



As the storm above us seems to settle down, there is still a drizzle and quite a strong chilly breeze. A rainbow graces us with its presence and it looks like we might get to have a star party. Photo by Terri.



Roger, Pete, Rick and William enjoyed the pizza provided by Joy Rae at this event. Roger had also provided Cream Sodas for the Telescope Team. Beyond the pizza party is the telescope set up area and we see Roger's scope covered by a silver shroud. Photo by Terri Finch.



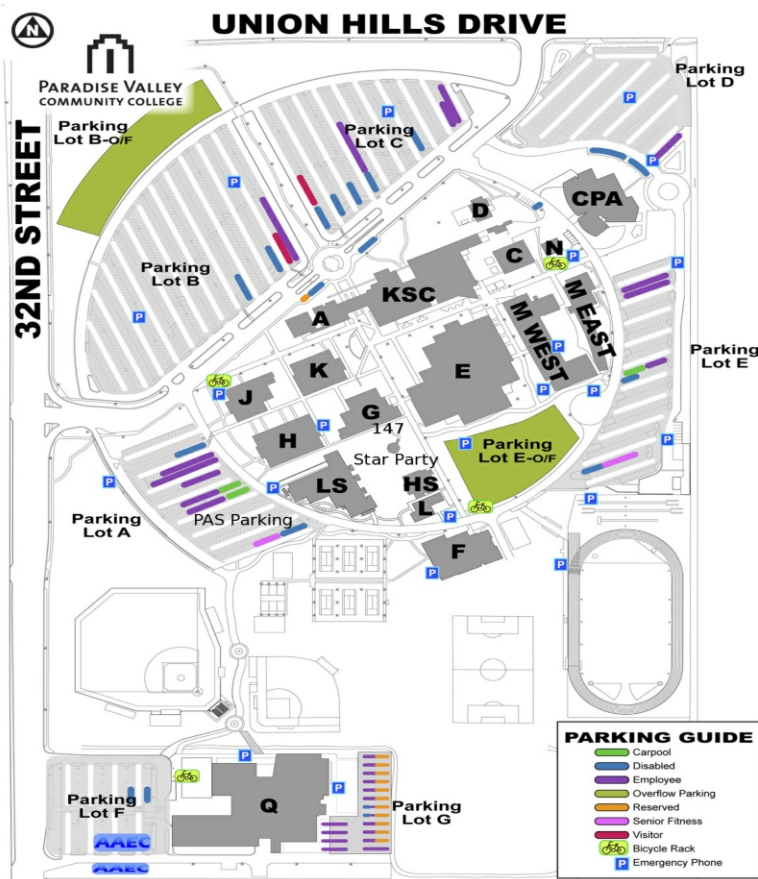
A double rainbow was seen at Hidden Hills. Roger's scope is covered in silver in this photo to protect it from the drizzling rain. Photo by Roger Anzini.



While it is still drizzling, the kids of the school are enjoying a play day on the playground in the background. The covered tables are where we had pizza for dinner. Roger is sharing the sky with Joy. William, Rick & Storm keeping an eye on the weather in anticipation of a clearing, so we can start the star party. Photo by Terri.

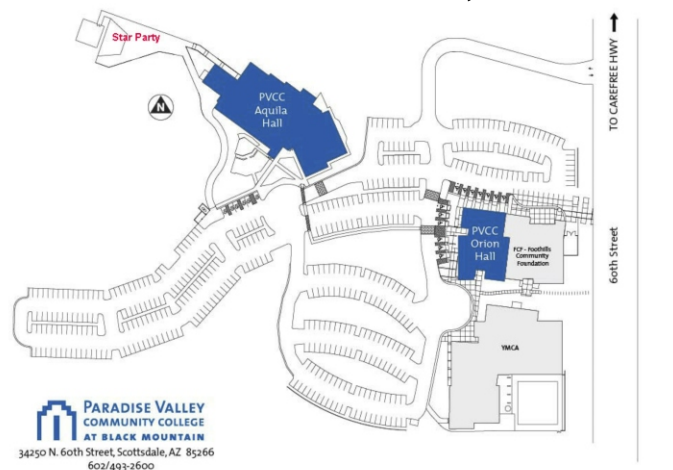
Map of PVCC Main Location

18401 N. 32nd Street | Phoenix, AZ 85032



Map of PVCC Black Mountain

34250 N. 60th Street | Scottsdale, AZ 85266



2020 PAS GUEST SPEAKER LINE-UP

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 for the details (their email addresses are at the top of page 2 in this newsletter).

Here are the next scheduled guest speakers at PAS:

Jan 16: John Barentine: Topic: High-mass Star Formation

Feb 6: Lauren Edgar Topic: Mars Rover Science

Mar 4: Michael Line: Topic: the Diversity of Extra-Solar Worlds

More information at:

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

PVCC Telescope Workshop Oct 17

By Terri Finch, Event Manager

The weather and temperature for this event was so wonderful! After a rather warm day, the evening got down to a decent 76 degrees with a slight breeze. It was pleasant to be outdoors from 8pm to 9:30pm assisting the fine attendees of this PVCC Telescope Workshop.

My Telescope Teachers for the evening were William Finch, Sam Insana, Calvin Vance, Roger Anzini, Stu Brackney and myself, Terri Finch. Yes, I was actually playing the part of telescope teacher at this event. Many thanks to my telescope teachers, as they were all super busy from 7pm when we were able to get into G-147 with Jenny Newjoy's assistance, until 9:30pm when the class concluded.

We had six wonderful people and five telescopes at this evenings event. Richard Sauerbrun brought his ETX 90 Meade telescope. William assisted Richard for most of the night. Kathleen Tiberi attended with a Nexstar 5inch BOSLT, along with Julius Kiss and his Celestron Nexstar 5SE and Gayle, his wife. The three of them with their two telescopes were assisted by Stu,

Cal and myself through the night. We also had David Cole with his Celestron Astro-master 114 scope that needed collimation. Sam helped David for most of the evening and they took apart the scope, cleaned it up, collimated it, and reassembled it for the first 1.5 hours of the class. We also had Nicole Ballentine attend with her Celestron Nexstar 102 GT and Roger assisted her for most of the evening.

The class attendees arrived as early as 6:50pm and stayed to 9:30pm. The sky was clear for viewing. Jupiter was disappearing behind the LS (Life Sciences) building on campus, and Saturn was following but luckily, Saturn stayed long enough to attempt some main scope to finder scope alignments.

PAS took in two new members on this evening. I wish to welcome Kathleen Tiberi (family members of Gayle and Julius) as a new member of PAS!!! And I welcome Richard Sauerbrun as a new member of PAS!!! The class members attending this event said they will be at the BMC star party on Oct 24th. Thanks to all who attended and especially to my Telescope

Teachers. We were super busy all night long and the teacher-to-student ratio was just perfect. We couldn't have asked for a better temperature or better skies. Looking forward to the next Free Telescope Workshops on Nov 14, 2019, Dec 12, 2019, Jan 30, 2020, Feb 13, 2020 and Apr 9, 2020.

Roger Anzini shares: I worked with Nicole and Kathleen last night, they both had questions about centering their little red-dot finders. I referred them to William and Stu about the red-dot finders. I showed them a Rigel telrad with a red flashing bullseye as a possible upgrade.

Both ladies needed advice on getting the go-to system working on their scopes. I recommended seeking tech support on YouTube videos for go-to tutorials.

Nicole asked how to seek out distant nebulae and galaxies. I advised that some were possible with her 102mm scope but her high interest in DSO might be pulling her in the direction of a scope with more aperture.

I hope it was a useful and productive evening for all.