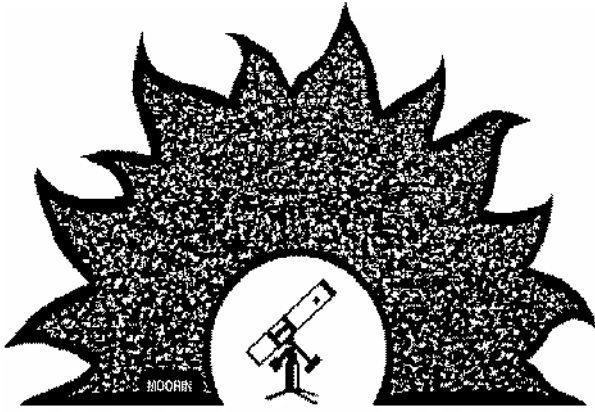




PAStimes

Phoenix Astronomical Society

www.pasaz.org

December 2017

Volume 69 Issue 4

PHOENIX ASTRONOMICAL SOCIETY — ESTABLISHED 1948

Steven Desch to Speak at December 7 Meeting

Organized by Terri Finch, Event Manager with data provided by Steven Desch

“Meteorites and Jupiter's Cleaving of the Solar System”

Steve Desch is a professor of astrophysics in the School of Earth and Space Exploration at Arizona State University. He has a wide array of research interests across astrophysics, planetary science, exoplanets and astrobiology. He is Principal Investigator of the NASA-funded Nexus for Exoplanet System Science grant at ASU. He studies origins of Earth's water, as well as geophysics and geochemistry of Ceres and Charon to determine whether they have subsurface water and cryovolcanism. A main area of his research is theoretical modeling of star and planet formation, especially using data from meteorites to constrain these models, which is the topic he'll speak on at PAS. Astronomical and especially meteoritical data strongly sup-

port models in which Jupiter was the first planet to form, and that it originally orbited where the asteroid belt is today. Jupiter split the solar system into two reservoirs of planetary materials.

PAS Annual Swap Meet

Terri adds: This PAS Meeting is the Annual PAS Swap Meet. Bring your astronomical items for sale or trade and cash to purchase those wonderful treasures at this year's Swap Meet. Doors open at 7pm so bring your items into room LS-203 and set up in this format, please.

If you have an item you wish to do as silent auction, set these items up for sale along the right side of the room when you walk in. There will be signs marking where to put your items.

Provide a piece (Continued on page 3)



Dec 7 Guest Speaker: Steven Desch.
Photo provided by Steven.

David Williams at Nov 2 Meeting

By Terri, Event Manager

After a pre-meeting dinner with our speaker, Mike opened the meeting and gave the “PAS Past President” badge to Sam. Our guest speaker, David then took the floor, speaking for a little under an hour, followed by questions and answer. David provided many interesting handouts and a mini poster of the Psyche mission which will launch in 2022. As always, David's lecture was entertaining, informative, interactive and well organized. We hope to have him come back at

PAS soon, with more exciting space mission data to share. There were 28 people in attendance.

After the speaker left, PAS held the monthly raffle which was won by Jackie (a friend of Bruce Wurst). Sam, Mike, Paul and I had a mini-meeting at the conclusion of the main meeting to discuss upcoming events. Here is what we decided: December 13, 2017 will be a Private Meteor Shower Party; March 10, 2018 (Continued on page 3)



At the September 2017 PAS Meeting, Sam Inzana took over from Bruce Wurst as Past President. Mike Marron took over from Sam as PAS President. Mike passed the “Past President” PAS Position Badge on to Sam at the November meeting. Photo by Don.

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December PAS Upcoming Public Events

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>

Dec 7: PAS Meeting at PVCC main

campus in room LS-203. Come enjoy a presentation by Steven Desch. Bring a snack to share. Bottled water provided by Bruce Wurst. Everyone welcome. Doors open 7pm. Meeting begins 7:30pm. Here's the link for more details about this event: <http://www.pasaz.org/forums/calendar.php?do=getinfo&e=2389&day=2017-12-7&c=1>

Dec 13: Geminds Meteor Shower Party in Carefree. Dinner will be a shared purchase of Pizza. Event and dinner begin

at 7pm. RSVP is required in the Private Calendar of PAS as this is a private PAS members-only event. <http://www.pasaz.org/forums/calendar.php?do=getinfo&e=2485&day=2017-12-13&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 more events.

DBG Adult Education Class Sept 16

By Terri, Event Manager

This adult class, held at the Desert Botanical Gardens by Joan McDonnell and Angelica Elliott was attended by William Finch, Terri Finch, Bruce Wurst and Mike Marron.

Upon arrival, Rocco, our electric cart escort took the team to the setup area at the Stardust Plaza. After getting the scopes set up, William, Mike and I walked to the classroom while Bruce stayed with the equipment. The class was from 6:30 to 8:30 - since it got dark at 7:45 pm, Bruce took the opportunity to find objects for the scopes while waiting for the class to finish.

After a welcome from Joan, I did a brief

introduction of PAS and what was on tonight's agenda. William then took over, explaining the workings of telescopes, followed by my review of the scopes we had on site and the objects we hoped to see. Mike then did a 20-minute "Astronomy 101" while William and I went out to the scopes to get ready for the class to join us there.

Outside we showed Jupiter, Saturn and several other objects. We made this class interactive with the Nasa Space Place Monthly Star Charts and pencils for class members to mark where they found objects. We also supplied red lights for them. All the

class members were there until the end and a few more stayed until everyone left.

After the class, Joan, William and I walked over to the new classroom to see if that location would be dark enough to do the observing part of the class. There was in fact, a great deal of light spill from the new classroom onto the observing area and we decided to keep the location as is for the next Adult Education Class at DBG.

I wish to thank Joan and Angelica for having PAS at this event. It was a great success with an eager class and lot's of interactivity. We look forward to the next one in Spring 2018.

PVCC Telescope Workshop Sept 21

By Terri, Event Manager

The telescope teachers for this event were Howard Moneta and William Finch. Helpers attending this event from PAS were Terri Finch, Rodney Fong and Mike Marron who brought his meteorites.

Attending this class we had Ray Gra-schen who has a Meade LX200 and wants

to do astrophotography with it. Howard assisted Ray. Wayne Schwab, who is a current PAS member, brought his 6SE Nextar. I stayed with him and learned all I could about this scope. Also attending was Liam, who is a Volunteer high school student working with Jenny Weitz.

It was a small but fun event. We had one other Meet Up RSVP, Nancy, who didn't attend. Many thanks to Jenny for lending us G-147 to have this event. We look forward to the next Free PVCC Telescope Workshop.

Steven Desch to Speak at December 7 Meeting

(Continued from page 1)

of paper with a full description of the item for sale and a starting bid. Leave room for others to add additional silent bids to the page.

The bidding on these items will take place from 7pm to 7:30pm and then again for whatever time is left after the guest speaker finishes, up to 9:45pm.

If you wish to sell your items in garage sale format (along the left side of the room when you walk in), put a tag on each item with the price you are asking. Remember, Garage Sale items are negotiable in price.

Most of the time, the items you bring sell easily and everyone leaves

happy. This event is open to everyone, you don't have to be a PAS member to participate. We have seen many different kinds of items at this event over the years, for example: observing chairs, eyepieces, filters and filter sets, telescopes (remember to list everything that comes with the scope and bring all those items with you to sell this night), star charts and other useful books, programs about astronomy, carts to haul your equipment to a set up location, red filtered flashlights, laser pointers, astronomy related vests, jackets, gloves, hats, scarves, socks, shoes, and other clothing items, astronomy games, and odds and ends as long as they have to do with the

hobby of astronomy.

If you'd like to help getting the room set up for the swap meet, feel free to arrive a little early and pitch in. Please use the table at the back of the room for handouts, freebies, snacks, drinks, etc.

We would love to have you join us for this fantastic guest speaker and our annual swap meet. Please bring a snack to share, or drop a donation in the snack fund box for next month's snacks.

This is also a great time to renew your PAS Membership for 2018. Please fill out a current membership form, give it to Terri to process and send you a digital receipt. We hope to see you there!

David Williams at Nov 2 Meeting

(Continued from page 1)

will be the PAS Messier Marathon; March 17, 2018, the nominal Messier Marathon date this year, will be a school event as Mike has a conflict. April 7, 2018 will be a public Binocular Star Party with Alex, Howard, Eric and Sam as the teachers. January 27, 2018 is the next PAS Social which is a private event and February 24, 2018 will be the next PAS Music Jam. We briefly touched on the next Meeting of

the Minds on February 8, 2018 as well as the Awards Ceremony / Member Appreciation event of April 26, 2018 which is a Private event.

Many thanks to everyone who attended and brought snacks to share and thanks to Bruce Wurst for the donation of the bottled water. We look forward to the next PAS Meeting on December 7th. See you there!

Happy Holidays



Dr. David Williams was at the PAS Meeting of Nov 2nd. He talked about the Psyche Mission and more. It was a very informative presentation. Photo by Don.

ASU West Star Party Oct 12

By Terri, Event Manager

With a much-improved weather forecast, we had a nice turnout of about 100 adults and children. Mike Marron and Ofelia Waters came with meteorites, Bruce Wurst brought his 12" scope, Ray Adams had his 10" scope while William and Terri Finch manned the PAS Table. William also provided laser assistance and Paul Schmidtke, the teacher at ASU West who

sets up these events, brought out the ASU West 6" dob.

The event went from 7pm to 9pm, with 6pm set up. Thankfully, unlike as in the past, the public attendees all waited until the event started at 7:00 pm (or later) to arrive. About 10 of the attendees were very interested in the night sky and stayed through while we packed up for the night

about 9:20pm.

Prior to the event, we had our regular Arby's dinner across from the campus with William, Terri, Paul, Mike, Ray and Ofelia.

Many thanks to the PAS Members who attended and to Paul for having PAS at this event. We look forward to the next ASU West Star Party which will be Mar 22 2018 and Oct 10 2018.

DBG Herb Garden Party Oct 16

By Sam Insana

We arrived at 6 pm to set up in the herb garden, with its delightful fragrances, but the guests didn't come over to observe until 9:30 pm! Bruce Wurst used his 12 inch scope to show open clusters and globular clusters. I used my 8 inch scope to

show an open cluster M45, a galaxy M31, a planetary nebula M57 and binary star Gamma Andromeda. There were no clouds, wind or rain and the temperature was mild, but there was a lot of light pollution from the white lights set up as decorations and

we had to use light pollution filters to show our objects. We stayed until 10:30 pm and then packed up. There were 8 guests including our gracious hostess Lynn Bryant from Berkeley Financial. All seemed to have fun with the stargazing.

President's Soapbox

By Mike Marron, President of PAS



President Mike Marron. This photo was taken by Don Boyd on Apr 27 2017 at the PAS Awards Ceremony as Mike was receiving an award.

I'm excited to begin my term as the new President of the Phoenix Astronomical Society. PAS is an educational organization which holds star parties, educational events at schools and colleges, road trips to observatories and more. My home is Cow Track Ranch, still a dark place on the edge of Phoenix, in Carefree Arizona where PAS holds star parties, music jams, and holiday events. Starting as a boy, I was immersed in astronomy as my parents ran multiple observatories - I learned everything I could about it. Our other members are equally knowledgeable in astronomy and other areas and all of us are happy to teach any aspect of it, from basics like how to use your telescope to advanced topics on stellar

evolution or quantum physics.

It has been a busy summer for me with PAS. Our friends Sam and Frank led Ophelia and me into the Oregon wilderness where we viewed the total solar eclipse, climbed valleys to find waterfalls and visited the Crater Lake Caldera. Pete Turner caught up with us in Portland. At home, lightning blew up another saguaro fifty feet away from the house. At first I thought it was a direct hit, but still had to replace thirty feet of burnt wiring and put the walls and ceilings back together!

We will have a great year with excellent presentations, road trips, public events, star parties, conventions and more. Welcome to the Phoenix Astronomical Society.

Bookmans Solar / Lunar Event Oct 15

By Terri, Event Manager

until 2:00. It was a great success!

At Bookmans Entertainment Exchange at 19th Ave and Northern in Phoenix, PAS held our first ever Solar/Lunar Observing Event in the parking lot, scheduled from 11:00 am to 1:00 pm. Attending this event with scopes were Don Boyd for the lunar view and Rick Cunningham for solar. Under the two PAS Canopies in front of the store, Mike Marron and Ofelia Waters set up with the meteorites while, William and Terri Finch who brought handouts, demos and other materials manned the PAS table. Paul Facuna also came to assist in setup and takedown. We had a good crowd interested in the views, the rocks from space, and everything we had to offer, keeping us there

I'm looking forward to the next event like this one on February 11th, 2018. These events happen infrequently because both the Sun and Moon have to be visible in the morning hours such that they do not set over the Bookmans building during the event, usually about a 3-hour window. The Moon also can't be too close to the Sun in the sky or viewing of the Moon becomes difficult. I wish to thank our telescope team for all their assistance and of course, Bookmans for lending us the use of their sidewalk to do this event.



Mike, doing what he loves to do, talk about Meteorites with a visitor to his table outside Bookmans for this event. Ophelia is with Mike.

Photo by Terri.



Don, William and Rick with Rick's scopes are seen set up under the PAS Canopy for this daytime event at Bookmans. Photo by Terri.

Black Mountain Campus Star Party Oct 19

By Terri Finch and Eric Steinberg

Tonight's event began with indoor science activities from 6 to 7 pm. This will be a regular feature of BMC star parties. Mike Marron, Ofelia Waters, Terri and William Finch did the indoor session at tables provided by PVCC's Courtney for our use. Things stayed very busy there until around 7:45 when we headed out to the PAS table at the top of the driveway.

For the star party, we had over 200 RSVP's, a solid percentage of whom attended on this warm clear night. Attending from PAS were Sam Insana with his 8" Newtonian, Eric Steinberg with the 22", Don Boyd with his 8", Calvin Vance with his 6" Dob and Bruce Wurst with his 12"

SCT. Jenny Weitz was also present with a good crowd at the dome with the new 14" scope. Helping out were George Zukauckas, Paul Facuna, Ron Walker and Howard Moneta.

The event ended around 9:30 once the highly appreciative crowd left. Thanks to everyone who participated and to Loretta Mondragon for facilitating the evening. ***

Kristen writes: Thanks again for organizing this event! My son had a lot of fun and learned a lot. How many kids can say they held million years old iron, played music with bananas, learned how they treat soldiers in the field, and saw Saturn all in one night! Take care. Kristen Newkirk

STAR PARTY & STEAM NIGHTS
 6:00 - 7:00 : STEAM Night
 7:00 - 9:45 : Star Party

Sept 14 STEAM Night: Astronomy & Star Party

OCT 19 STEAM Night: Nursing/EMT & Star Party

Nov 9 STEAM Night: Forensics & Star Party

Feb 15 STEAM Night: Festival of Tales & Star Party

Mar 8 STEAM Night: Earth Week & Star Party

Apr 12 STEAM Night: Star Wars & Star Party

May 3

FREE COMMUNITY EVENTS
 RSVP: events@pasaz.org
 34250 N. 60TH St., Scottsdale, AZ 85266
paradisevalley.edu/black-mountain
 802.493.2600

PARADISE VALLEY COMMUNITY COLLEGE AT BLACK MOUNTAIN MARICOPA COMMUNITY COLLEGE Phoenix Astronomical Society

Japanese Friendship Garden Oct 6 & 7

By Terri, Event Manager

The Otsukimi Moon-viewing Festival, an old Japanese custom, is marked by the Japanese Friendship Garden with a yearly public event, including an evening of fantastic activities, food, a great show of dancers, and more. They also like to provide views of the Moon through a telescope. For more details about this event, see this link: <http://www.japanesefriendshipgarden.org/otsukimi2017>.

On Friday Oct 6, Sam Insana attended with his 8" telescope, along with William and Terri Finch with the PAS Table, and Mike Marron with his meteorites.

Sam writes: I showed Saturn for 90 minutes and the moon for an hour. Hundreds looked through my 8 inch reflector until William took over for about 20 minutes so I could eat some chicken curry with rice and walk the beautiful grounds. There were artists, musicians, koi ponds, statues, fountains and Japanese lanterns among the landscaping. William and I carried the entire telescope to a new location the last hour to see the rising moon which had been blocked by trees. We stayed 30 mins longer so everyone could see the special moon and Mike's meteorites. We divided the PAS tip jar among all 4 of us. We each got zero!!!! That's 0 divided by 4, carry the 1 = 0 (an adjusted quote from the TV show "Firefly.") It was a fun event.

Terri writes: One highlight around 7:40 was a bright Iridium flare. I had a collection of about 25 people gathered around to enjoy the view which conveniently occurred during a break in the music. Sam and I estimated about 400 in attendance tonight. Looking forward to Saturday night, Raina, our contact, said that Saturday usually brings 5 times as many in attendance.

On Saturday Oct 7, PAS had William, Terri and Mike again, plus Ofelia Waters and Mark Johnston with his 5.5" refractor. Mark and Mike both had a constant collec-

tion of people and the night went by really quickly. The weather was excellent both nights

We took in one new member - welcome Cymara Wood! I estimate that there were over 2000 people in attendance. Thanks to Raina for having PAS at the event - we'd definitely like to do it again next year. We met a lot of great people and got our club information out to them. It was a great success.

Mark writes: I started showing Saturn as soon as it was visible. Getting the familiar "I don't see anything...(pause)... Wow!!" Despite the heat rising from the buildings and being downtown, we could see the Cassini division, the shadow of the planet on the rings, Titan, and either Tethys or Mimas (not sure which). After Saturn set behind the trees William and I lugged the telescope over to a spot where we could finally get a good look at the waning gibbous Moon over the trees. One little boy about 6 years old came back about 5 times



William and Mike are seen at the PAS table before dark as a few patrons of the park walk by and stop to talk with Mike about meteorites. Photo by Terri on Oct 6.



Sam setting up his telescope for the evening of viewing Saturn until it sets, and then the Moon. Photo by Terri on Oct 6.

to look through the scope even though I only had 2 objects the entire evening. He was fascinated.



William, Ofelia & Mike at the PAS Table all lit in red for a night of lots of people, great entertainment, and fun. Photo by Terri in Oct 7.



This photos sums up the event.... Japanese Geisha Girls dancing on the right, Sam's telescope in the foreground sharing views of the gorgeous Moon, and people having a great time. Photo provided by Sam.



"This is Mike doing his thing," is the caption William put on this photo he took on Nov 6.



Mark setting up his telescope for the expected attendance of 2000 on Oct 7. Photo by Terri.

Bookmans Telescope Workshop Oct 8

By Terri, Event Manager

Attending this event were Bruce Wurst, Alex Vrenios, Rodney Fong, William and Terri Finch. We had no RSVP's expected but we decided to hold the event in case we had walk-ins, which we did. A gentleman who had seen us at Bookmans

for a Sidewalk Astronomy event, came over to talk to Alex and me and ask about when our next event would be.

While we waited for more walk-ins, we discussed a variety of club and non-club

related topics - an enjoyable time, even without the public. Ed and Bette Wurst joined the Team around 4:30 pm for dinner at Carlos O'briens. Thanks to the telescope team for being at this event - looking forward to the next one.



Studying Storms from the Sky

By Teagan Wall

The United States had a rough hurricane season this year. Scientists collect information before and during hurricanes to understand the storms and help people stay safe. However, collecting information during a violent storm is very difficult.

Hurricanes are constantly changing. This means that we need a lot of really precise data about the storm. It's pretty hard to learn about hurricanes while inside the storm, and instruments on the ground can be broken by high winds and flooding. One solution is to study hurricanes from above. NASA and NOAA can use satellites to keep an eye on storms that are difficult to study on the ground.

In Puerto Rico, Hurricane Maria was so strong that it knocked out radar before it even hit land. Radar can be used to predict a storm's path and intensity—and without radar, it is difficult to tell how intense a storm will be. Luckily, scientists were able to use information from a weather satellite

called GOES-16, short for Geostationary Operational Environmental Satellite – 16.

The “G” in GOES-16 stands for geostationary. This means that the satellite is always above the same place on the Earth, so during Hurricane Maria, it never lost sight of the storm. GOES-16's job as a weather satellite hasn't officially started yet, but it was collecting information and was able to help.

From 22,000 miles above Earth, GOES-16 watched Hurricane Maria, and kept scientists on the ground up to date. Knowing where a storm is—and what it's doing—can help keep people safe, and get help to the people that need it.

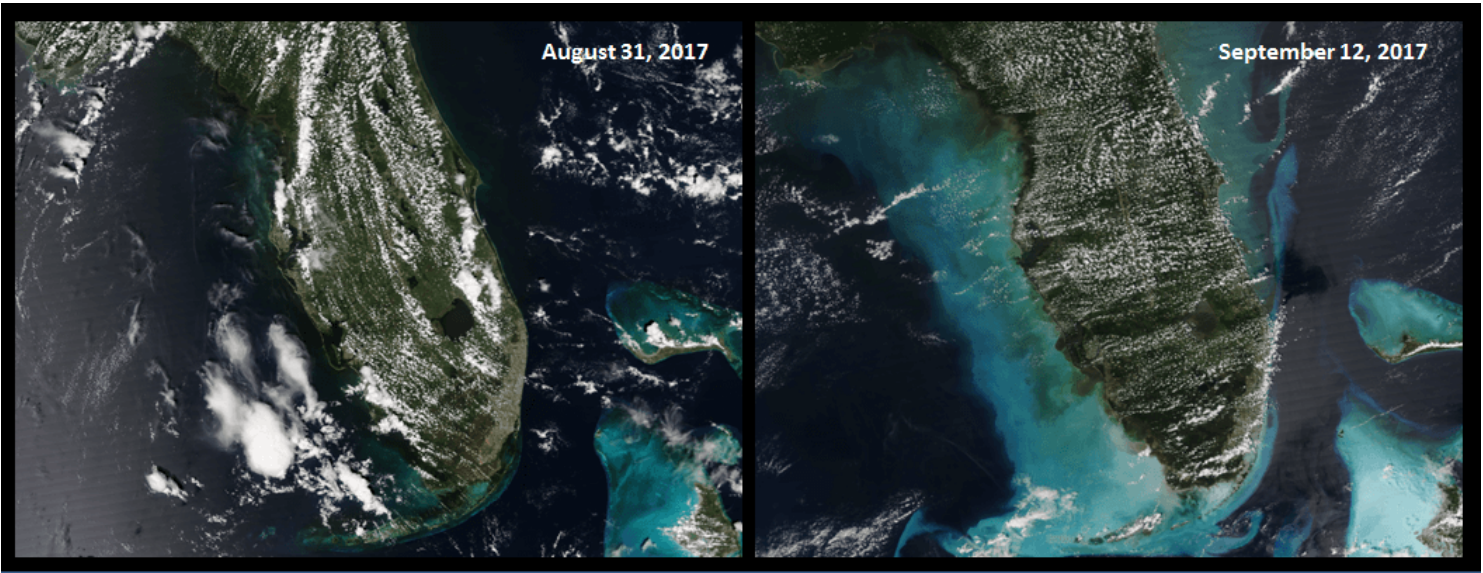
Hurricanes can also have a huge impact on the environment—even after they're gone. To learn about how Hurricane Irma affected the Florida coast, scientists used images from an environmental satellite called Suomi National Polar-orbiting Partnership, or Suomi-NPP. One of the

instruments on this satellite, called VIIRS (Visible Infrared Imaging Radiometer Suite), took pictures of Florida before and after the Hurricane.

Hurricane Irma was so big and powerful, that it moved massive amounts of dirt, water and pollution. The information captured by VIIRS can tell scientists how and where these particles are moving in the water. This can help with recovery efforts, and help us design better ways to prepare for hurricanes in the future.

By using satellites like GOES-16 and Suomi-NPP to observe severe storms, researchers and experts stay up to date in a safe and fast way. The more we know about hurricanes, the more effectively we can protect people and the environment from them in the future.

To learn more about hurricanes, check out NASA Space Place: <https://spaceplace.nasa.gov/hurricanes/>



These images of Florida and the Bahamas were captured by a satellite called Suomi-NPP. The image on the left was taken before Hurricane Irma and the image on the right was taken after the hurricane. The light color along the coast is dirt, sand and garbage brought up by the storm. Image credit: NASA/NOAA

What's Up For December?

By Rod Sutter

Name	Date	<u>Planets</u>		Set
		Rise		
Mercury	12-15-17	06:51		17:02
Venus	12-15-17	07:00		16:56
Mars	12-15-17	03:29		14:28
Jupiter	12-15-17	04:43		14:58
Saturn	12-15-17	07:45		17:46
Uranus	12-15-17	13:55		02:50
Neptune	12-15-17	12:02		23:23
Pluto	12-15-17	09:07		19:10

January PAS Meeting

By Terri, Event Manager

Please note the changes for the January PAS Meeting:

- 1) Room change to LS-204
 - 2) Date Change to Wednesday Jan 17, 2018.
- See you there!!!

PAS is Incorporated in the state of Arizona as a 501(c)3 organization. Our newsletter PAStimes is published monthly from September to May, and is distributed via the Internet. All issues are available on our Website www.pasaz.org. Ads for astronomy equipment are provided as a courtesy to buyers and sellers and do not constitute any endorsement by PAS or PAStimes. All photos by Don Boyd unless otherwise noted. All articles and photos are copyright their respective authors or PAStimes.

Fall Binocular Class in Carefree October 21st

By Richard Pipkin

I got to the event at about 6:45, after driving back from a visit to my grandson in San Diego. I took my tripod-mounted 10x50 Nikon bino's. Unfortunately, my tripod is too short for comfortably viewing anything much above 45 degrees, but I did manage to get a look at a beautiful moon early on, a magnificent

view of the Double Cluster to the northeast, and a few other deep sky objects later in the evening.

Many thanks to Howard Mone-ta, who invited us to see several objects through his bino's mounted on a very sturdy 80-inch-tall tripod. Also, thanks to Eric Steinberg for his comprehensive "star tour" of the

heavens, and, of course, to Mike Marron for his generous contribution of his "dark site" for the evening.

Terri, Event Manager, adds: (absent from event) Also attending this event was Paul Facuna, Charles Beaudet Don Boyd and Eric Steinberg.

2018 Upcoming FREE Public Events

By Terri Finch, Event Manager Events@pasaz.org

PAS has a variety of fun and educational events open to the public. RSVP is requested for most events in case the weather cancels the event. Some events have limited seating and RSVP is required for those events.

Bookmans Telescope Workshops will be on these Sundays, once a month: Jan 7, Feb 4, Mar 4, Apr 8, May 6, June 3, July 22, Aug 19, Sept 23, Oct 21, Nov 18, and Dec 16. RSVP is required for this event.

PAS Meetings will be on these Thursdays, once a month: Jan 17 (Wednesday), Feb 1, Mar 1, Apr 5, May 10, Sept 6, Oct 4, Nov 1, and tentatively

Dec 6.

PVCC Telescope Workshops will be on these Thursdays, once a month: Jan 25, Feb 22, Apr 19, Sept 13, Oct 18, Nov 15, and tentatively Dec 13. RSVP is required for this event.

Black Mountain Campus major star parties will be on these Thursdays, once a month: Feb 15, Mar 8, Apr 12, May 3, Oct 11, and Nov 8.

ASU West Star Party will be on Mar 22 and tentatively on Oct 10.

Bookmans Solar / Lunar Daytime Event will be Sunday Feb 11, and Saturday Nov 3.

Bookmans Sidewalk Astronomy will

be on these Saturdays: Apr 28, May 26 (tentative), June 23, July 28, Oct 20 (Tentative) and Nov 3.

PAStimes Newsletter posting dates: We strive to post the newsletter to the site on the Sunday before the next PAS Meeting. Those dates will be: Jan 14, Jan 28, Feb 25, Apr 1, May 6, July 1 (if we do a Summer issue), Sept 2, Sept 30, Oct 28, and Dec 2.

We hope to see you at all of these fun events that are free and open to the public. For a chronological list of upcoming public events, go to this link: <http://www.pasaz.org/forums/downloads.php?do=file&id=49>

3 Scopes for Sale with Accessories:

1) 10 inch Dobsonian 2) Meade ETX-LS8 with hard case and built in dolly 3) Celestron NexStar 5 with high quality hard case. Additional items: empty small hard case, never opened cover, two hard cases with lenses. I have small boxes for all lenses. Spreader-lens holder. Also have two cotton cloth scope covers, not shown. The actual retail prices are to the left of the items, in the photos of the lists, and the half price selling price is on the right. I have all the original sales slips, software and user manuals. I check email every day. I want to sell my three tele-

scopes and a selection of books. I am asking 1/2 of the purchase price. Equipment is like new. Here's the link to the lists and photos: <https://www.dropbox.com/sh/o8ri3j4ba4xws0t/AADvvlqlb9jK0sfT7pc6sska?dl=0>. It's a lot of equipment for sale, something for everyone. Contact Mary to purchase these items marylj3@gmail.com. Phone is 602 866-8693.. Land line, please leave message. Email is much much better, as I check it daily. The location to see these scopes will be near PVCC Main Campus.

December 15 2017

Sunrise: 07:25

Sunset: 17:23

Full: December 3

Q3: December 10

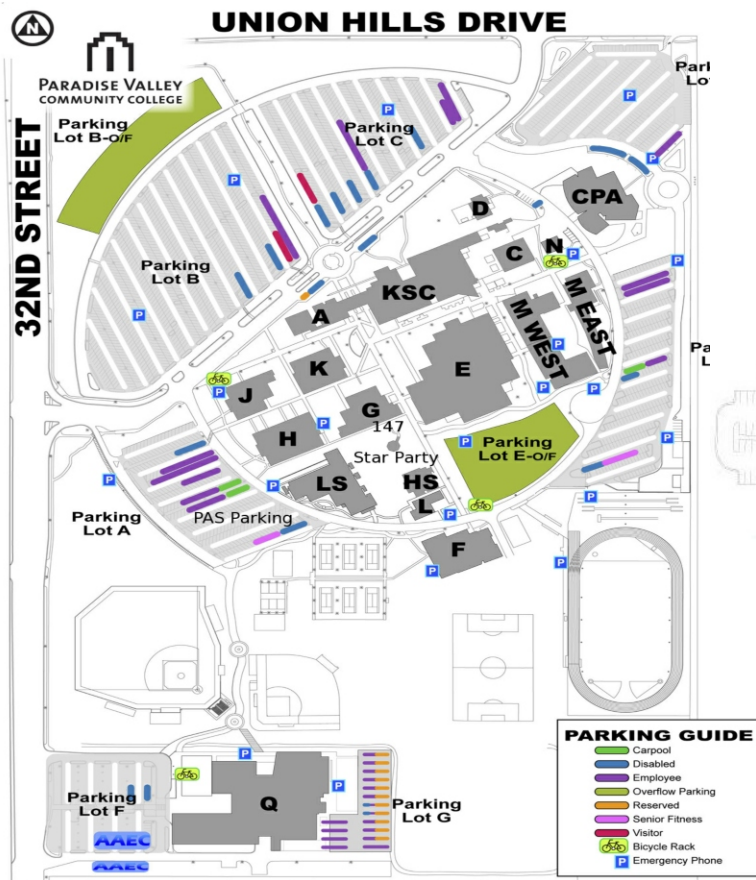
New: December 17

Q1: December 26



Map of PVCC Main Location

18401 N. 32nd Street | Phoenix, AZ 85032



Map of PVCC Black Mountain

34250 N. 60th Street | Scottsdale, AZ 85266



2017 PAS GUEST SPEAKER LINE-UP

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

PAS Meetings are held on Thursdays in Room LS-203 unless otherwise noted. Do you have an idea for a guest speaker? Email Terri the details. Here are the scheduled guest speakers at PAS:

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

Jan 17: Mike Marron "Cosmological Jets: Using Jets to Learn the History of the Universe"

Feb 1: Emilie Dunham "All about Meteorites"

Mar 1: Andy Odell "Binary Stars"

December 2017

Sun	Mon	Tue	Wed	Thu	Fri	Sat
					1	2
3	4	5	6	7 PAS Meeting	8	9
10	11	12	13 Meteor Shower Party (Private)	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						