



PAStimes

Phoenix Astronomical Society

www.pasaz.org

March 2019

Volume 70 Issue 7

PHOENIX ASTRONOMICAL SOCIETY — ESTABLISHED 1948

Jim Renn to Speak at March 6, 2019 Meeting

Please note that this meeting is on a Wednesday in LS-203!!!

"The Vatican Observatory and Quantum Cosmology"

With the recent passing of renowned cosmologist Stephen Hawking, many articles have been published about his views on cosmic creation. He commented extensively on the topic of the Big Bang theory of creation stating that "the Universe has no origin as we would understand it and therefore it has no beginning."

I would like to respond to the theories proposed by Hawking by quoting the late Vatican cosmologist, Fr. William Stoeger, SJ who was a colleague and classmate of Hawking at Cambridge.

Jim Renn writes: I will begin my talk with a history of the participation of the Vatican in scientific endeavors since 1582 to explain how the Vatican has supported pure scientific research.

I am a member of the Board of Directors of the Vatican Observatory Foundation

and I have been interested in astronomy since the age of 10.

I was a planetarium lecturer at the College of San Mateo in San Mateo, CA when I was age 19. I have been associated with the Walker Starbarn Planetarium in Cave Creek since 2014 where I assist the planetarium director, Ron Walker, in creating astronomical presentations.

Thank you for this opportunity to represent the Vatican Observatory Foundation at this presentation.

Bring a friend! Bring a snack to share and let's all welcome our fantastic guest speaker for this month at the Wednesday evening meeting. Also, please note, there is a Meet and Greet Dinner prior to the meeting on this night, and here's the link to RSVP by the day before the meeting: [http://www.pasaz.org/forums/calendar.php?do=getinfo&e=2842&day=2019-3-](http://www.pasaz.org/forums/calendar.php?do=getinfo&e=2842&day=2019-3-6)

[6&c=1](#). Bottled water will be provided by Bruce Wurst, PAS Member at Large. Everyone is welcome at the PAS Meetings! Hope to see you there!



*Jim Renn – March PAS Guest Speaker
Photo courtesy Jim Renn*

PAS Meeting February 7, 2019

By Terri, Event Manager

Dinner prior to the meeting was held at Chili's on 3rd Street and Bell Road in Phoenix, from 4:30pm to 6:30pm, and there were ten PAS Members and the guest speaker in attendance.

The meeting was called to order at 7:30pm by President Mike Marron, who then turned it over to our fabulous guest speaker, Richard Harshaw. Richard shared his love for Speckle Interferometry. He enlightened everyone with the great knowledge and information he shared, and the presentation concluded about 9pm. The

meeting wrapped up with a few announcements, and the raffle winner was new PAS member Patricia. We had 34 in attendance at this meeting.

I wish to thank everyone who brought a snack to share. Bruce Wurst brought the bottled water and a bunch of fun snacks. Thank you all for attending this wonderful meeting. Looking forward to the March 6, 2019 PAS meeting. Please make a note that it is a Wednesday!!! See you there!



Richard Harshaw at the February PAS meeting sharing some great information with the meeting attendees. Photo by Don

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PAS Upcoming Events for March 2019

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>

Mar 1: School in Phoenix (Private)

Mar 2: Public Star Party at South Mountain from 6:30 to 8:30pm. More details: <http://www.pasaz.org/forums/calendar.php?do=getinfo&e=2832&day=2019-3-2&c=1>

Mar 3: Tonto NP Star Party (Private)

Mar 6: Civic Center Public Star Party 3:30pm to 5:30pm. More details can be found at this link: <http://www.pasaz.org/forums/calendar.php?do=getinfo&e=2805&day=2019-3-6>

Mar 6 Wednesday: PAS Meeting: PAS Meeting at PVCC Main Campus in LS-203 at 7pm. More details: <http://www.pasaz.org/forums/calendar.php?do=getinfo&e=2740&day=2019-3-6&c=1>

Mar 6: Meet & Greet Dinner prior to the Meeting - RSVP needed by day before. More details: <http://www.pasaz.org/forums/calendar.php?do=getinfo&e=2842&day=2019-3-6&c=1>

Mar 7: Tonto NP Star Party (Private)

Mar 7: School in Phoenix (Private)

Mar 7: Huge Public Star Party at Black Mountain Campus of PVCC from 6pm to 9:30pm. More details: <http://www.pasaz.org/forums/calendar.php?do=getinfo&e=2717&day=2019-3-7&c=1>

Mar 8: School in Phoenix (Private)

Mar 9: Heritage Days at Tonto National Monument 8am to 5pm Public event. More details: <http://www.pasaz.org/forums/calendar.php?do=getinfo&e=2806&day=2019-3-9&c=1>

Mar 9: PAS Social for PAS members only. More details: <http://www.pasaz.org/forums/calendar.php?do=getinfo&day=2019-3-9&e=2745&c=1>

Mar 10: Heritage Days at Tonto National Monument 8am to 5pm Public event. More details: <http://www.pasaz.org/forums/calendar.php?do=getinfo&e=2806&day=2019-3-9&c=1>

Mar 16: Star Party in Avondale (Private)

Mar 17: Free Telescope Workshop at Bookmans from 3:30pm to 5:30pm. Bookmans is at 19th Ave & Northern in Phoenix. RSVP required with Terri. More details at this link: <http://www.pasaz.org/forums/calendar.php?do=getinfo&e=2736&day=2019-3-17&c=1>

Mar 18: Tonto NP Star Party (Private)

Mar 21: School in Avondale (Private)

Mar 21: 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&e=2732&day=2019-3-21&c=1>

Mar 22: Star Party in Scottsdale (Private)

Mar 25: Star Party at DBG (Private)

Mar 28: Huge Public Star Party at Black Mountain Campus of PVCC from 6:30pm to 9:30pm. More details: <http://www.pasaz.org/forums/calendar.php?do=getinfo&e=2718&day=2019-3-28&c=1>

Mar 30: Star Party in Downtown Phoenix (Private)

Mar 30: Public Star Party at Fountain Hills. More info: <http://www.pasaz.org/forums/calendar.php?do=getinfo&e=2847&day=2019-3-30&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.

Tonto National Monument to Celebrate Heritage Days on March 9 & 10, 2019

Roosevelt, AZ – Celebrate Heritage Days with Tonto National Monument in recognition of Arizona Archaeology and Heritage Awareness Month on March 9 and 10 from

8:00 a.m. – 5:00 p.m. The weekend activities will include prehistoric technology demonstrations, Apache dancers, kids' activities, representatives from Archaeology Southwest, the International Dark-Sky Association, and more! This event is free and open to the public.

The Lower Cliff Dwelling will be open for self-guided hikes from 8:00 a.m. – 4:00 p.m. with rangers available to answer ques-

tions. The Upper Cliff Dwelling, which normally requires a reservation, is open for self-guided hikes from 9:00 a.m. – 2:00 p.m. Please plan to bring sturdy shoes, sunscreen, water, and snacks. Parking will be limited, especially for RVs and oversized vehicles; carpooling is encouraged.

Tonto National Monument protects two cliff dwellings built by the Salado people over 700 years ago. Established as a national monument in 1907 by President Teddy Roosevelt, the cliff dwellings were part of the early archeological preservation movement in America. The Monument is open daily from 8:00 a.m. to 5:00 p.m. except for December 25.

No camping is available at Tonto National Monument. The nearest camping is available at Windy Hill Campground in Tonto National Forest. For more information on camping visit: <http://www.fs.usda.gov/tonto/>

For more information contact: (928)467-2241 and tont_information@nps.gov or visit: <https://www.nps.gov/tont> <https://www.facebook.com/TontoNPS> <https://www.instagram.com/TontoNPS> https://twitter.com/tonto_nps See flier on page 5.

Fountain Hills Annual Star Party March 30, 2019

Data provided by Ted Blank - Event Organizer

Fountain Hills stands apart from other communities for a number of reasons: its signature fountain, its geography and scenery, its small-town feel in the corner of a major metropolitan area, its adjacency to parks, preserves, and national forest, and now, its dark skies. Help us celebrate our dark skies at the second annual Dark Sky Festival! This is a free community event for anyone.

Activities for the whole family will range from astronomy-themed virtual reality, telescope viewing and a laser tour of the night sky, to educational exhibits, food vendors, a beer garden, and live entertainment, to name a few. Our mission is to educate our communities about the advantages of using smart lighting to protect our unique dark sky.

The festival will take place on Satur-

day, March 30, 2019, from 4pm to 9pm at the Fountain Hills Community Center located at 13001 N La Montana Dr, Fountain Hills, AZ 85268.

PAS Members wishing to help out, with or without telescopes, please go to the Private Calendar and RSVP so Ted knows who is attending this event: <http://www.pasaz.org/forums/calendar.php?do=getinfo&e=2848&day=2019-3-30>

What's Up For March?

By Don K. Boyd, PAStimes Editor

Name	Date	Rise	Set
Mercury	03-15-19	06:23	18:29
Venus	03-15-19	04:45	15:35
Mars	03-15-19	09:10	22:56
Jupiter	03-15-19	01:29	11:26
Saturn	03-15-19	03:16	13:19
Uranus	03-15-19	08:17	21:21
Neptune	03-15-19	06:22	17:53
Pluto	03-15-19	03:34	13:37

All Times Arizona Time

Bold means the object is "visible" in the evening

March 15, 2019

Sunrise: 06:39

Sunset: 18:36



New: March 6



Q1: March 14



Full: March 20



Q3: March 27

Desert Botanical Garden Luminaria December 2018

By Various Attendees of this event - Review 2 of 6

Part One of this review can be found in the February Newsletter issue on pages 2 and 3.

Las Noches de las Luminarias of December 2018 at the Desert Botanical Garden (DBG) included the PAS telescope team of four telescopes and one 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.

Terri writes: We started out this Lumi season on **December 1** with clouds. Lots of clouds. The forecast of 20% cloudy reversed to about 10-20% clear. The majority of the evening the sky was covered in clouds, but a few objects were viewable. Rick Cunningham, Storm Moon, Ted Blank and Terri Finch, located Mars, Saturn before it set, the North Star very briefly, and E.T. Open Cluster. This night the Lumi event was sold out: 2400 patrons attended. Of the patrons we met in the Wildflower Garden, the majority were from out of town, visiting from the Eastern United States. It was a pleasant night, but few objects were shown as the clouds moved quickly across the sky. I think the longest Storm and I had any one object in the field of view was maybe three minutes, then there were clouds for twenty-plus minutes, then maybe we'd see the object again for a short time. I wish to thank Mike for keeping the crowd entertained. He had a group around his table of meteorites at the front of the Wildflower Garden all night long.

Mike writes: A six year old girl was so impressed with my rocks that she spent her night collecting small rocks that she spent her night collecting small rocks from DBG to give to me before she left. I explained I had more than enough rocks but I would tell her what she had found. The first one was granite, so I explained how it contained mica, quartz and feldspar and that it made continental crustal rock. The second one was basalt so I explained how it made oceanic crustal rock. The third rock I had to stop, get my microscope, and examine it in detail. After a minute I said "Honey, you found silver and gold."

Terri writes: **December 2** was colder with a lot of dew, but skies were clear from 5:30 - 8:30pm. During the last hour, we

could not show much at all due to the cloud cover. Storm would greet the people as they arrive at her scope, and tell them, "We are experiencing a lot of clouds right now. When it clears, we plan to show many great objects." And the people who took the time to walk up to our two scopes would ask "So, what can we see through the telescopes?"

On December 3, Monday, only about 650 patrons were there, and we saw probably about 300 of them. This night was so cold, the cold, damp air went right through our clothing and into our bones. However, the sky was clear the whole night and I was able to show Saturn until it set, then Albireo for about an hour, and then Orion Nebula for the rest of the evening. Storm showed E.T. Open Cluster for the whole night. Mike was our presenter, and Roger and Ted were very actively showing Pleiades, Mars, and a few other objects. It was a good night, but very chilly with a heavy dew and a mist in the air that fogged up the eyepieces.

Three ladies walked up to my scope. I showed them the Orion Nebula. One of the ladies, who was having trouble with balance, looked through my scope then looked up in the sky and said, are we looking in this direction? The other two ladies were talking to Storm about her object but then turned in to hear what their semi-drunk friend was talking about. So, the drunk lady says "Are we looking in the sky over here?" and she pointed 45 degrees from Orion. I asked her "Is that where you see the telescope pointing?" She said, as I was getting out my laser to show her where in the constellation of Orion, she was looking, "I'm not pointing any where near where the scope is look-



Sam Insana is set up with his Meteorite collection at the Desert Botanical Gardens Luminaria Event of December 2018. This photo was provided by Sam and taken on December 2.



Along the trail around the Wildflower Garden at DBG, several slightly lit PAS signs could be found where the 4 telescopes were set up for the DBG Luminaria event of Dec 2018. This photo was taken by William Finch on December 1 – the first night of the 2018 Luminaria event.

ing," and her friends broke out in laughter. When they calmed down, I pointed out where Orion was and let her know that it is an easy thing to not know where the telescope is pointing when it is dark outside. All three gals left to head down the trail to more telescopes, giggling their heads off. I heard them say something about the drunk gal not even being close to Orion when she pointed to where she thought the telescope was aimed. The drunk patrons are always the most entertaining to have at our telescopes.

Ted writes: I brought two scopes on one mount, the C9.25 and a WO Megrez

80mm APO for wide-angle views. I had people passing by my almost continuously all night, which was great. For the first two played hide-and-seek with Mars through the clouds. Then the came out and they were a hit in the low-power scope. One lady we could see other galaxies, so I showed her the core of Andromeda the C9.25 with a 35mm Panoptic eyepiece I could just get both the double cluster into view. Many people commented on how that was. I showed people the Pleiades in binoculars, which was hit.

I brought an integrating video camera, but it would not correctly, so I could not get deeper shots of objects like M31. All though, it was a great night of outreach.

Terri writes: **December 4** the forecast was for 61% cloudy, decided to provide two telescopes and two presenters for this took the night off and let my team do the event without me. Part through the night, Bruce texted me to say he had a view of and Rick had Mars. Later, in the evening, when I asked Bruce sky looked, he reported it was totally clear. I had looked at a app on my phone and it said 98% cloud cover, so I guess there is like an eyewitness report. I heard the night was a great success.

To be continued in future newsletter issues



Jake Von Ruhr is seen standing near Storm Moon's scope at the Water Tower Overlook scope location within the Wildflower Trail at the DBG Luminaria event. This photo was taken by William Finch on December 1, 2018.

For more information contact:
 (928)467-2241 or
tont_information@nps.gov
 and visit: <https://www.nps.gov/tont>

Tonto National Monument
 26260 N AZ Hwy 188 Lot 2
 Roosevelt, AZ 85545

Celebrate Heritage Days!

Activities and demonstrations throughout the weekend.

Admission is Free

The Monument is open from **8:00 am - 5:00 pm**

Hike to the Upper Cliff Dwelling from **9:00 am - 2:00 pm**

Hike to the Lower Cliff Dwelling from **8:00 am - 4:00 pm**

Reservations are not required.

Archaeology Activities
Kids' Activities
Apache Dancers
Visit The Upper Cliff Dwelling

South Mountain Star Party November 24, 2018

By Pete Turner

Pete writes: We had about sixty or so people, perhaps more. They came throughout the two hours. Rick focused on Albireo and I did NGC 457 (ET Cluster). Don was focused on Pleiades after working on his scope. He later switched to the moon. Saturn had set. There were two other tele-

scopes there (non-PAS). One focused on Andromeda Galaxy until the moon came up. The other was doing astrophotography. Towards the end of the night the gentleman doing astrophotography showed some images that he had taken in the last couple of weeks (Horsehead nebula, Rosette Nebula

and Triangulum Galaxy).

Terri, Event Manager adds: PAS members who attended this event were Rick Cunningham, Pete Turner and Don Boyd. I wish to thank Lisa and Jonathan for having PAS at their event on this night.

PVCC Telescope Workshop January 24, 2019

By Terri Finch, Event Manager

This was a super busy telescope workshop. We had nine RSVP's to start, but two of them cancelled earlier that day. That left us with seven RSVP's, and that was plenty. I had the help of Mark Johnston, who arrived later than planned, but his help was much appreciated. Also, Calvin Vance and Pete Turner were super helpful. Stu Brackney attended to learn, but really helped out at this event. William Finch and I attended. I wish to thank my Telescope Teachers for a wonderful, successful event that couldn't have happened without their assistance.

Getting to this class was a challenge. There was a major closure at Bell Road and 32nd Street with a fatal traffic accident. William and I arrived about five minutes late, and Pete was already helping those who attended with telescopes.

Those attending the class were: James Woodhull, along with family members Cin-

dy and Nanette, attending with their Orion Star Blast EQ 4.5" scope. I believe Pete assisted them and then Mark chatted with them for most of the evening. We had Sid and Terry, who attended to find out what telescope to purchase, spent their time chatting with William and me, and then became new members of PAS. Welcome Sid Shahid and Terry Woodbeck as new members of PAS!!! Jake O'Riley attended to find out what scope to purchase and spent most of his time with Stu. Many thanks to Stu for helping Jake at this event. Norm Fisher attended with his NexStar 4SE, and I believe Pete assisted him. Mike Tubbs attended with his wife Fran, wanting to learn how to use their Celestron C8 Evolution scope; they didn't bring it with them, but spent quite a bit of time talking to William about how to set it up.

When William finished helping Mike, he and I helped the rest of the group figure

out what telescope to purchase. I wish to thank William for all his assistance. He did a wonderful job leading the "What scope to purchase" discussion for about one and a half hours. PAS Member Jan MacFarlane brought her scope, but when Pete and William went out to help her bring it in, it was too big and too far to carry it. Instead, Jan joined the discussion on what to purchase, and asked questions of her own. One RSVP was a no-show.

This was a super busy event with everyone talking, learning, teaching, and assisting in their own way. Thank you all for attending. We hope to see all of you again, at future events. The next two PVCC Telescope Workshops are on: March 21, 2019 and April 11, 2019. An RSVP is appreciated as space is limited at these events and you can confirm that they are happening on the PASaz.org online Calendar.

Star Party at Encanto School January 25, 2019

By Sam Insana, PAS Member

On January 25th, six PAS members showed the night sky and meteorites to about 60 teachers, students and parents at Encanto School, grades 1 through 4.

The day was very cloudy but weather forecasts showed it would clear by star party time, and that is just what occurred. It was a beautiful night, with Roger Anzini

showing the Orion Nebula with his 16-inch scope. He also provided handouts to students showing the Orion Constellation and distances to each main star in light years.

Mike Marron had his meteorite collection. Sam Insana had his 8-inch scope and showed Gamma Andromeda Double Star and the Andromeda Galaxy. Pete Turner

had his 12-inch scope and showed the Pleiades. Don Boyd had his 8-inch scope and showed the M44 beehive cluster with help from Paul Facuna. Rick Cunningham showed a double star in Gemini. The only drawback was the stadium lights from Phoenix College, about 1/2 mile away. I took a Bortle reading of 7.5.

Want To Complete More Observing Programs?

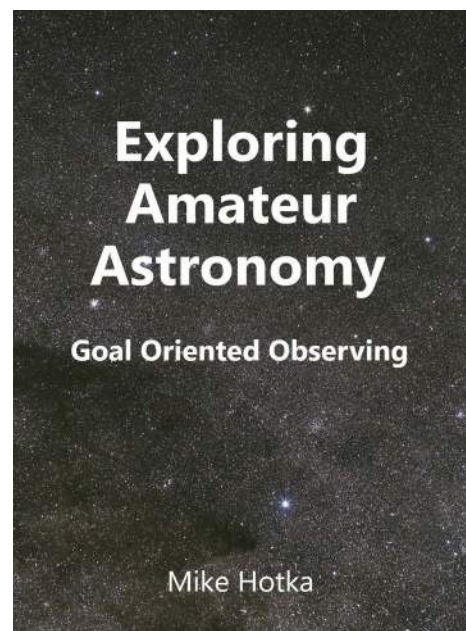
By Mike Hotka

Have you ever wanted to start and complete more of the Astronomical League observing programs but just didn't know how? Mike Hotka's new book, *Exploring Amateur Astronomy – Goal Oriented Observing*, will not only help you start more observing programs, but will also share an observing methodology to help you get more out of your observing sessions. Mike is a Platinum Master Observer and has completed all but three of the currently existing observing programs. In his book, he shares tips and tricks he has learned throughout the years of how to overcome the learning curves of some of these programs, so that you can start recording observations sooner. He wrote this book because of his love of astronomy and his desire to share his knowledge of observing celestial objects with others.

Mike's book explains the concept of setting SMART goals to ensure you observe on a regular basis. The book goes on to explain a methodology that Mike has developed and refined over the years of how to plan an observing session, find the resources you will need in the field and the importance of keeping a good observing log of your observations.

The remainder of the book contains a chapter for each of the observing programs that Mike has completed. These chapters describe how Mike approached each observing program and he shares the techniques that were effective in completing the observations for each program. With this knowledge, you will be able to start making observations from the very beginning, for even the most difficult observing program.

See "More Observing Programs" on page 6



More Observing Programs?

Continued from page 6

This book emphasizes learning and refining astronomical observing techniques. It is designed to aid the beginner as well as the experienced amateur astronomer

to train their eye to see faint celestial objects. This book is dedicated to those that would like to start and complete more Astronomical League observing programs.

Exploring Amateur Astronomy – Goal Oriented Observing can be purchased in a paperback or eBook version from Amazon.com.



Springtime Planet Party

By David Prosper

March brings longer days for Northern Hemisphere observers, especially by the time of the equinox. Early risers are treated to the majority of the bright planets dancing in the morning skies, with the Moon passing between them at the beginning and end of the month.

The **vernal equinox** occurs on **March 20**, marking the official beginning of spring for the Northern Hemisphere. Our Sun

shines equally on the Northern and Southern Hemispheres during the moment of equinox, which is why the March and September equinoxes are the only times of the year when the Earth's north and south poles are simultaneously lit by sunlight. Exacting astronomers will note that the length of day and night on the equinox are not *precisely* equal; the date when they are closest to equal depends on your latitude, and may

occur a few days earlier or later than the equinox itself. One complicating factor is that the Sun isn't a point light source, but a disc. Its edge is refracted by our atmosphere as it rises and sets, which adds several minutes of light to every day. The Sun doesn't neatly wink on and off at sunrise and sunset like a light bulb, and so there isn't a perfect split of day and night on the equinox - but it's very close!

Ruddy **Mars** still shines in the west after sunset. Mars scoots across the early evening skies from Aries towards Taurus and meets the sparkling Pleiades star cluster by month's end.

March opens with the morning planets of **Jupiter**, **Saturn**, and **Venus** spread out over the southeastern horizon before sunrise. A crescent **Moon** comes very close to Saturn on the 1st and occults the ringed planet during the daytime. Lucky observers may be able to spot **Mercury** by the end of the month. March 31 opens with a beautiful set of planets and a crescent Moon strung diagonally across the early morning sky. Start with bright Jupiter, almost due south shortly before dawn. Then slide down and east towards Saturn, prominent but not nearly as bright as Jupiter. Continue east to the Moon, and then towards the beacon that is Venus, its gleam piercing through the early morning light. End with a challenge: can you find elusive Mercury above the eastern horizon? Binoculars may be needed to spot the closest planet to the Sun as it will be low and obscured by dawn's encroaching glow. What a way to close out March!

[Discover all of NASA's current and future missions at nasa.gov](#)



Earth from orbit on the March equinox, as viewed by EUMETSAT. Notice how the terminator – the line between day and night – touches both the north and south poles. Additional information can be found at <http://bit.ly/earthequinox> Image credit: NASA/Robert Simmon



STEAMtastic

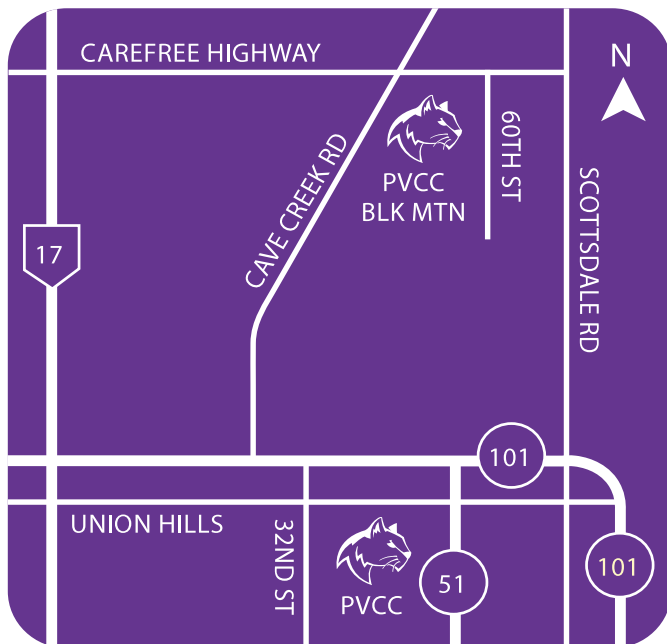
A celebration of Science, Technology, Engineering, Arts, Mathematics, & Music

Thursday, March 7, 2019

5 PM - 7 PM: Activities | 7 PM - 10 PM: Star Party

This Paradise Valley Community College STEAM event makes science, technology, engineering, arts, mathematics, and music fun and accessible through activities for all ages!

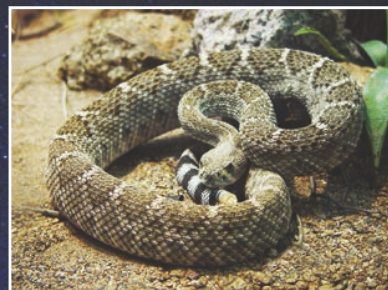
RSVP to:
PARADISE VALLEY.EDU/BLACK-MOUNTAIN/STEAMTASTIC-ATTENDEES



**PARADISE VALLEY
COMMUNITY COLLEGE**
A MARICOPA COMMUNITY COLLEGE
Black Mountain

Potato Launcher • Extract DNA • Drones
Star Party • Dry Ice Sorbet • And More!

Science and Stars Extravaganza at South Mountain



**Saturday:
March 2 and April 6
5:30 – 9 p.m.**

Celebrate science with telescope viewings,
live animals, astronomy chats, local science experts,
and hands-on activities for all ages!

The park gate will be open until 8 p.m. for this event.

Donation of \$5 per group suggested.

**Telescopes provided by Phoenix Astronomical Society and
South Mountain Astronomy Club, weather dependent.**

Partnership made possible by

Owner



City of Phoenix
PARKS AND RECREATION DEPARTMENT

Building healthy communities through parks, programs, and partnerships

Operator

**ARIZONA CENTER for
NATURE CONSERVATION**

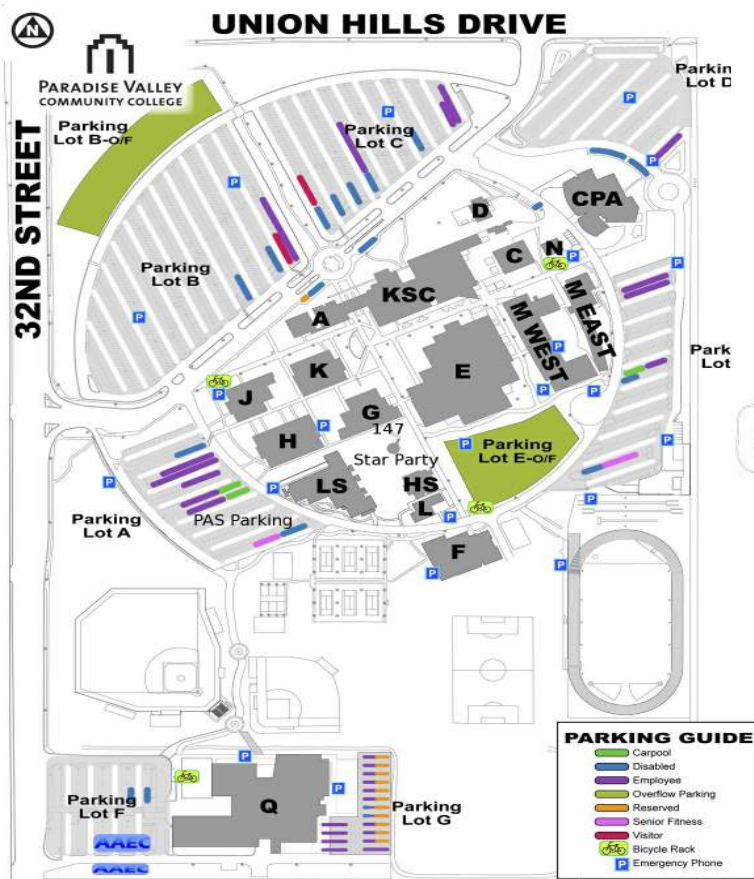
at South Mountain Park

10409 South Central Avenue | Phoenix, AZ 85042 | smeec.org | 623.334.7880



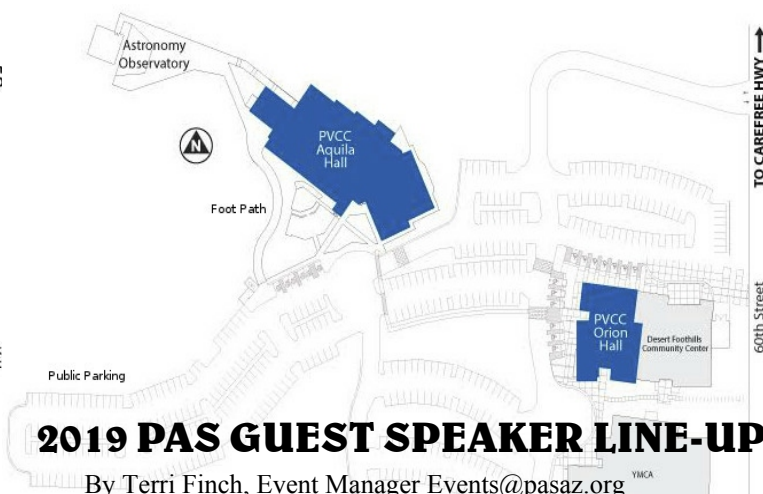
Map of PVCC Main Location

18401 N. 32nd Street | Phoenix, AZ 85032



Map of PVCC Black Mountain

34250 N. 60th Street | Scottsdale, AZ 85266



2019 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 the details (their email addresses are at the top of page 2 in this newsletter).

Here are the next scheduled guest speakers at PAS:

April 4 in room K1000A: Will Grundy "The Findings of the MU69 Kuiper Belt Object Flyby by the New Horizons Mission on March 28th"

May 9: David Lee Summers "Surveying the Universe"

Sept 5: TBA

More information at:

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

March 2019

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
					1 <i>School in Phoenix (Private)</i>	2 <i>Public Star Party</i>
3 <i>Star Party (Private)</i>	4	5	6 <i>PAS Meeting</i>	7 <i>Huge Public Star Party</i>	8 <i>School in Phoenix (Private)</i>	9 <i>Heritage Days Public Event PAS Social (Private)</i>
	11	12	13	14	15	16 <i>Avondale Star Party (Private)</i>
17 <i>Free Telescope Workshop</i>	18 <i>Star Party (Private)</i>	19	20	21 <i>Free Telescope Workshop</i>	22 <i>Star Party in Scottsdale (Private)</i>	23
24	25 <i>Star Party in Phoenix (Private)</i>	26	27	28 <i>Huge Public Star Party</i>	29	30 <i>2 Public Star Party</i>
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