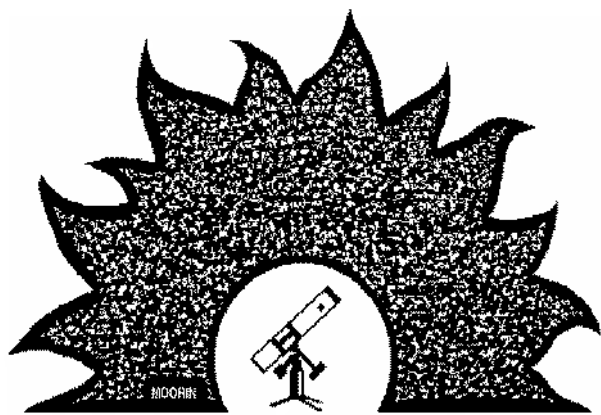




PAStimes

Phoenix Astronomical Society

www.pasaz.org

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Volume 67 Issue 6

PHOENIX ASTRONOMICAL SOCIETY — ESTABLISHED 1948

Ted Blank to talk at February Meeting

By Terri, Event Manager

At the February Meeting, we hope to see a great turnout of members and guests. Please bring a snack to share and donate a little to the PAS snack fund to keep it solvent. Your coins or \$1 are greatly appreciated.

Ted became a member of PAS just recently. He's a great guy with a powerful enthusiasm for astronomy and his topic. Bring a friend to the meeting and let's all enjoy what Ted has to share with us!



Getting Started as a "Citizen Scientist" with Occultation Timing

By Ted Blank, PAS Member

The International Occultation Timing Association (IOTA) provides predictions of occultations of stars by asteroids and the Moon, along with grazing occultations of stars by the mountains of the Moon's north and south polar regions. By observing and timing occultations, amateurs have contributed to the discovery of new double stars, improved knowledge of the shape and orbits of hundreds of asteroids and helped map the Lunar polar regions. Observing occultations is fun, and you can do it with

equipment you already own.

IOTA provides information and recommendations on observing equipment and techniques, reports and publishes in scientific journals, and holds a yearly conference. Their website, www.occultations.org is a good place to get started. A recent observation of a binary asteroid (Antiope) can be seen at this link: http://www.asteroidoccultation.com/observations/Results/Data2015/20150402_90%

[20AntiopeProfile.gif](#).

Ted Blank has been an active IOTA member for 7 years and has enjoyed "chasing the shadows" of asteroids all over the country. In his talk he will demonstrate how to find where the asteroid shadows will pass, how to observe and record asteroid and lunar occultations and how to reduce the data to obtain light curves and timing information. Equipment will be on display and demonstrated during his talk.

PAS Meeting of Jan 14

By Terri, Event Manager

The PAS Meeting of January was "different". When we arrived, we found the Life Sciences building all locked up, so we gathered in the Library hall. From about 6:30 to 7:15, President Sam and I called various resources to see if we could get into the LS building to hold our meeting. It

turned out that PVCC did not have a record for a PAS meeting on this date and could not provide an authorized person, so we had the meeting right there in the Library hall. The catch then was that the Library building closes at 8pm, so we went right to the talk. We got Alex logged into a nearby



See Jan 14 Meeting on page 3

Phoenix Astronomical Society Contact Info

President	Sam Insana	602-315-4750	President@pasaz.org
Past President/Equipment Manager	Bruce Wurst	602-971-3555	PastPresident@pasaz.org
Vice President	Howard Moneta		VicePresident@pasaz.org
Secretary	Kevin Witts		Secretary@pasaz.org
Event Manager	Terri Finch	602-561-5398	Events@pasaz.org
Treasurer	Eric Steinberg		Treasurer@pasaz.org
Newsletter Editor	Don K. Boyd		Editor@pasaz.org
PAS Host	Rodney Fong	602-486-5547	
Librarian	Rod Sutter		Librarian@pasaz.org
Member at Large	Jenny Weitz	602-787-6818	jennifer.weitz@paradisevalley.edu
Member at Large	Alex Vrenios	602 789-6556	axv@cox.net
Webmaster	Chris Johnson		Webmaster@pasaz.org

February 2016 Upcoming Events

By Terri, Event Manager

Feb 4: PAS Meeting at PVCC in Room LS 204. Come enjoy a wonderful presentation by Ted Blank. Bring a snack to share. Bottled water provided by PAS snack fund. 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=1750&day=2016-2-4&c=1>

Feb 5: School Star Party (Private) PASTimes Star Tour Members Only <http://www.pasaz.org/forums/calendar.php?do=getinfo&e=1743&day=2016-2-5&c=2>

Feb 10: CTCA Star Party (Private) PASTimes Star Tour Members Only <http://www.pasaz.org/forums/calendar.php?do=getinfo&e=1836&day=2016-2-10&c=2>

Feb 11: Huge public star party at PVCC Black Mountain Campus, 60th Street and Carefree Hwy from 7pm to 10pm. Set up is 6pm for telescopes. Everyone welcome. RSVP is requested with Terri Events@pasaz.org. This event is weather permitting. When you RSVP by email, please include the number in your party. We usually provide 10-14 scopes for your viewing pleasure. Please do not touch the telescopes. More details: <http://www.pasaz.org/forums/calendar.php?do=getinfo&e=1761&day=2016-2-11&c=1>

Feb 12: School star party (Private) PASTimes Star Tour members only <http://www.pasaz.org/forums/calendar.php?do=getinfo&e=1890&day=2016-2-12&c=2>

Feb 17: School Star Party (Private) PASTimes Star Tour members only <http://www.pasaz.org/forums/calendar.php?do=getinfo&e=1881&day=2016-2-17&c=2>

Feb 18: Free Telescope Workshop at PVCC main campus, 32nd Street and Union Hills Rd - 7pm to 10pm. RSVP is required with Terri Events@pasaz.org. Seating is limited. When you RSVP, please leave your first name, and the make and model of your telescope. Bring your telescope and accessories to this event. We meet in G-147 and by the telescope dome on campus. We have no telescopes for sale at this event. This event is weather permitting. More details: <http://www.pasaz.org/forums/calendar.php?do=getinfo&e=1892&day=2016-2-18&c=1>

Feb 19: School Star Party (Private) PASTimes Star Tour Members Only <http://www.pasaz.org/forums/calendar.php?do=getinfo&e=1807&day=2016-2-19&c=2>

Feb 21: Free telescope workshop at Bookmans, 19th Ave and Northern in Phoenix - 3:30pm to 5:30pm. RSVP is required with Terri Events@pasaz.org. When you RSVP, email the make and model of the telescope you need assistance with. We also assist with suggestions and advice on what telescope to purchase to match your needs. We have no telescopes for sale at this event. More details: <http://www.pasaz.org/forums/calendar.php?do=getinfo&e=1895&day=2016-2-21&c=1>

Feb 24: Back up for Feb 10 CTCA

(Private) PASTimes Star Tour Members Only

<http://www.pasaz.org/forums/calendar.php?do=getinfo&e=1837&day=2016-2-24>

Feb 25: PAS Meeting at PVCC in Room LS 204. Come enjoy a wonderful presentation by various guest speakers. Bring a snack to share. Bottled water provided by PAS snack fund. 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=1847&day=2016-2-25&c=1>



Jan 14 Meeting Attendees. Photo by Terri.



Jan 14 Meeting Attendees. Several new faces were seen at this meeting. Photo by Terri.

Jan 14 Meeting

From page 1

computer - everyone gathered around him, and he did his presentation. There were 26 people in attendance. Alex completed his presentation just as Security asked us to leave; since it was only a little after 8pm, we decided to move to the Village Inn.

The not so funny part of the night was that not only the Life Sciences building was closed, but so was the Village Inn! It's a good thing Sam called first. Thankfully, the Village Inn on 3rd St. and Bell was open so we all went over there and discussed some

items that needed to be presented to the group. Village Inn saw 12 in attendance. Eric was not able to make it to the meeting, but joined us there along with Sam, William, Terri, Ed, Bette, Bruce, Don, Alex, Mike, Sie, Paul and Christine. We opened this meeting with Christine Mintzmyer being congratulated and welcomed as the newest PAStimes Star Tours member. Sam then announced that Comet Catalina is now visible, spoke about the Jan 19 Occultation and the Jan 27 Meeting of the Minds.

We then turned our discussion to what events to have at Mike's house this year.

Thanks to everyone who filled out the newsletter survey,

to everyone who brought snacks and especially to Sam who sprung for drinks and desserts for the group. The cheesecake was awesome! Hope to see everyone at the February PAS Meeting when we have a fantastic guest speaker - PAS member Ted Blank.

Awesome Upcoming PAS Public Events (March to December 2016)

By Terri, Event Manager

Keep up-to-date on All PAS Events by visiting the online Calendar at: <http://www.pasaz.org/forums/calendar.php>

Mar 3 Thursday: PAS Meeting

Mar 10 Thursday: Black Mountain Campus Public Star Party

Mar 13 Sunday: Free Telescope Workshop at Bookmans

Mar 27 Thursday: Free Telescope Workshop at PVCC

Mar 31 Thursday: ASU West Public Star Party (PAS provides many telescopes)

Apr 7 Thursday: PAS Meeting

Apr 17 Sunday: Free Telescope Workshop at Bookmans

Apr 21 Thursday: Free Telescope Workshop at PVCC

Apr 28 Thursday: Black Mountain

Campus Public Star Party

May 5 Thursday: PAS Meeting

May 12 Thursday: Black Mountain Campus Public Star Party

May 15 Sunday: Free Telescope Workshop at Bookmans

Jun 19 Sunday: Free Telescope Workshop at Bookmans

July 17 Sunday: Free Telescope Workshop at Bookmans

Aug 21 Sunday: Free Telescope Workshop at Bookmans

Sep 1 Thursday: PAS Meeting

Sep 18 Sunday: Free Telescope Workshop at Bookman

Oct 6 Thursday: PAS Meeting

Oct 16 Sunday: Free Telescope Work-

shop at Bookman

Nov 3 Thursday: PAS Meeting

Nov 4, 5, 6 Weekend: Free Solar Viewing event at Rock a Rama in Black Canyon City

Nov 13 Sunday: Free Telescope Workshop at Bookman's

Nov 25-26 Weekend: Desert Botanical Garden Luminaria Event with star party (DBG charges fee for entrance).

Dec 1 Thursday: PAS Meeting

Dec 2, 3, 4, 9, 10, 11, 16, 17, 18, 20, 21, 22, 23, 26, 27, 28, 29, 30, 31: Desert Botanical Garden Luminaria Event with star party (DBG charges fee for entrance).

We hope to see you at our fun, free (unless otherwise noted due to location) events.

Feb 25 Special Public Meeting with Guest Speakers

By Terri, Event Manager

This Special Meeting, open to the public, will have several guest speakers. Doors open 6:30 and the lectures begin at 7pm. Bring a snack to share and enjoy the mini-presentations by PAS Members. Here is the list, not necessarily in the order below:

Greg Schwimer (1 hour): "Beyond the eye - Electronically Assisted Observation" Faint fuzzies can be difficult to see even with the best equipment under the best conditions. Add the ever-growing light bubble that extends beyond the urban land-

scape and viewing that must-see object can become a nearly impossible task. There is an alternative. Greg will speak about his experiences in the field of "Electronically Assisted Astronomy" over the last year and how he uses modern electronics to observe beyond what the eye can see.

Don Boyd (30 mins): "Polar Align a Scope" After a couple of years of trial, error and research I have come up with a technique of accurately polar aligning my GEM. It should also be applicable to

wedged fork mounts as well, with a few slight modifications. This not only assures that objects stay in the eyepiece, but also, when using a goto scope, gets the scope closer to the alignment stars so there is less likelihood of using the wrong star. This should also help astrophotographers as well, by lessening the time it takes to do a drift alignment. This method does not involve using a polar scope. Using this method I am getting alignments of 15 arc minutes and I am sure I can approach 5 arc minutes with further practice.

President's Corner

By Sam Insana, President of PAS

The darkness of the night sky can be measured in Bortle units, based on the famous scale that John Bortle published in the February 2001 issue of Sky and Telescope magazine. A Bortle 1 sky is the darkest possible, where the Milky Way casts a shadow on the ground. Bortle 5 skies have the Milky Way faintly visible to the naked eye, while Bortle 9 represents very light-polluted inner city skies, with only a few very bright stars visible. <https://academo.org/demos/bortle-scale/> is a site that shows the Orion constellation in each of the Bortle conditions 1-9.

Over the last several months I have used a sky quality meter to determine the sky darkness at various sites I have used to

observe with PAS and on my own. The darkest site, about 100 miles west of Phoenix, is "Antennas" measured at 2.0 Bortle. The next darkest is Cherry Road, about an 80 mile drive north of Phoenix at 2.5 Bortle. Mike's property in Carefree is a Bortle 4.3, a much shorter drive with good viewing and a house for comfort, unlike Antennas and Cherry Road. PVCC Black Mountain has been 5.0 which is average on the Bortle Scale. The Cancer Treatment Center is 6.6, Desert Botanical Gardens averages 6.6, My house, near 20th Street and Bethany Home Rd, is 7.0, Cochise Elementary in Scottsdale is 7.8, Apache Elementary in Peoria is 8.0 thanks to having 16 flood lights on the field.

When you take an average size amateur telescope of 8 inches and look at an object such as the Ring Nebula (M57) at a site like PVCC Black Mountain and then look at the same object at Antennas, a very dark site, the object will be much brighter and can be viewed with much higher power. It looks about as good with an 8 inch telescope at Bortle 2 as a 16 inch telescope at Bortle 5. Therefore, to get the most out of your scope, get to a dark site a few times a year. Eric, Kevin, Howard, I and several other PAS members go to Antennas and Cherry Road regularly. Please join us. Of course you don't want to go that distance with a moon out, so be aware that there are only about 8 or 9 nights a month to choose from. ***

Many Millions of Thanks to Sam!

By Terri, Event Manager

The DBG Lumi events came and went for those not involved, but it was a really rough, consistent, daily routine for some of the telescope team members and in particular Sam, who was our main weather watcher for the event. I wish to thank Howard

Moneta and Alex Vrenios also for their input, but Sam... Wow, every morning of a Lumi event, he was up checking the weather sites and sending me his recommendations for that evening's event. It wasn't an easy task - like Sam told me once... he'd

like a chance to sleep in too. Nevertheless, Sam was there through all 24 events with the weather updates that helped determine who attends, who drops, and what we will do that night. Many thanks to Sam and the Star Tours team. ***

All AZ Star Party Oct 10

By Sam Insana, President

The night of Oct 10th was the second night of the All Arizona Star Party at the airfield near Antennas, 100 miles West of Phoenix. Kevin, Howard, Sam, Dewell, Greg and his wife and lovable doggie attended from PAS. We met the President of EVAC, Claude, and walked around looking at some of the 50 plus telescopes. SAC also had people attend. Clouds were a big problem for the first 2 hours after sunset. Several people left early thinking it wasn't going to clear. The clouds finally did leave around 8:30 pm and we had good observing the rest of the night. My Skymeter showed the area was a Bortle 2.0 at midnight. I had my best views of Andromeda Galaxy, M81, M82, Orion Nebula and Mercury that I have ever had in my 8 inch newtonian

reflector.

I also saw 5 new objects: 2 galaxies, 2 open star clusters and 1 globular cluster. One of the best objects shown in Howard's larger scope was the Veil Nebula. Kevin showed he could split Albireo with his new 20 power binos, and Dewell showed me a globular cluster with breathtaking pinpoint stars.

The area had interesting wildlife: rattlesnakes, horned lizards, red tailed hawks, bats, and the strangest insects.

Kevin alerted us to a spectacular event around 5:30 am: Venus, Mars, Jupiter, Mercury and the Moon all stacked up top to bottom in the eastern sky. As we were leaving around 6:30 am, there was a beauti-

ful sun pillar. We then hit the all you can eat breakfast buffet on the way back off exit 103. It was still under \$10 and I highly recommend it. I am glad Dewell, Howard, Kevin and Greg talked me into going since the early clouds made me hesitate.

Eric Steinberg adds: Schedule conflicts prevented us from going on Saturday, but Ora and I went out to the airstrip Friday night. Forecasts were slightly iffy, but the evening turned out to be beautiful with warm temperatures, calm winds and some of the best transparency I've seen at that location. I was able to get 25 more Herschel II objects done, many of which were crisp and bright, a real treat given the nature of most of the H II objects!***

Bookmans Telescope Workshop Oct 18

By Terri, Event Manager

At this telescope workshop, the skies were very cloudy and threatening rain. The forecast said no rain until 6 pm, however, the rain hit and hard while we were (thankfully) indoors doing our workshop.

In attendance from PAS were William and Terri Finch, Don Boyd, Rodney Fong, Alex Vrenios, Howard Moneta, Bruce Wurst, and Ed and Bette Wurst. Many thanks to the telescope team for their great advice and assistance at this event.

From the public we had Peter Halopoff (+2) with his really nice Voyager telescope, assisted by Don, William, Alex and Howard. Candace (+3) attended to find out what telescope to purchase. We helped her and new member George Sabo at the PAS table to learn about their options. Welcome new PAS member Candace! We shared many ideas, but because she was mostly interested in what scope would work well for the whole family, we advised her to look at a

Dob.

After the event, we went to Carlos O'Briens for Mexican food with Ed, Bette, Bruce, William, Terri, Don, Rodney, Bruce's fiancée Donna and her mom, Helen. It was a delicious dinner at which everyone over ate - we had to walk around after dinner to "unstuff"! Looking forward to the next Telescope Workshop at Bookmans. ***

PVCC Telescope Workshop Oct 22

By Terri, Event Manager

The temperature started out warm and comfortable but turned just a bit chilly later, enough to need a light jacket. We had 2 RSVP's attend, along with PAS members: Kevin Witts, Alex and Diane Vrenios, Sam Insana, Don Boyd, William and Terri Finch, Rodney Fong and Mike Marron. From the public we had Nicole Almanza with her 5.5" OneSky telescope and Kaushik Keerthi who came with his daughter. We arrived with Rodney and after a slight hitch getting the doors open, began at 6:55. Nicole was eager to get started so she set up her scope with some help from Kevin

and Rodney. While I was setting up for the event, Kaushik arrived. Sam had also brought his telescope since we didn't have access to the telescope closet for this event. Kevin shared his excellent telescope comparison page with Kaushik while Nicole was being assisted on the other side of the room. Nicole had not unboxed her scope yet - she said she purchased it 3 months ago and didn't know how to set it up. Kevin, William and Sam assisted her indoors and then took it outside for first light. She was thrilled to see the Moon through her scope. Her excitement level was contagious!

Kaushik and his daughter then went outdoors with Sam, William and Nicole to look through the 2 scopes. About 9pm, Kaushik came back inside, thanked the group and departed. Nicole came back in and we helped her put away her scope and gave her advice on various ways to keep her scope safe. Mike then spoke about his meteorites for another 15 minutes or so which Nicole enjoyed until about 9:20pm. Thanks to telescope team who took very good care of the attendees and made this a successful event. ***

The Planets for February

By Leah Sapir

Jupiter has returned to our evening sky! Our favorite giant planet will be rising around 9 pm at the beginning of February, and 7 pm towards the end of the month. We will see Jupiter reaching opposition in March.

Uranus and Neptune will also be in our evening sky this month. Uranus will be high in the west at sunset, setting around 11 pm at the beginning of February, and 9 pm towards the end of the month. Neptune will be low in the western evening sky when February begins, and will be sinking into the twilight by mid month.

Mars rises around 1 am throughout the month. (It will rise a little later at the begin-

ning of February, and a little earlier towards the end of the month.) Saturn rises around 3:30 am when February begins, and around 2 am by the end of the month.

Mercury and Venus are low in the east just before dawn, and only around 5 degrees apart. Venus rises around 5:30 am at the beginning of February, and Mercury rises around 6. By the end of month they will be disappearing into the sunrise.

On the morning of February 1, the third-quarter moon will follow Mars across the sky from east to south, from 2 am to dawn. Then on the morning of February 3, starting around 4 am, the moon will accompany Saturn. On the morning of February 6,

a slender crescent moon will join the early-morning cluster of Venus and Mercury, low in the east. Watch for them shortly after 6 am.

By February 15, the first-quarter moon will be in the evening sky, and will be visiting the Hyades from sunset till around 2 am, moving south to west. Then on the night of February 23-24, the full moon will accompany Jupiter across the sky from around 8 pm to dawn. The third-quarter moon will again join up with Mars in the east on the morning of February 29, starting around 1 am.

The new moon will be on February 8, and the full moon on February 22.

Binocular Star Party at Saguaro National Park Nov 8

By Sam Insana, PAS President

On November 8th, 10 PAS members attended a binocular star party west of Tucson. The desert setting had mild temperatures, dark skies, no clouds and no wind. Tim, from Kitt Peak Observatory, was our instructor. He was quite talented as he held a binocular in one hand and a green laser in the other and pointed out dozens of deep sky objects for us to enjoy. We each had binoculars, some with powers of 8, some with 10 and one with 15. A document was provided to each of us showing important details about binoculars, such as exit pupil, magnification, field of view, etc... Tim also handed out a November Sky Map showing a dozen objects that can be seen Naked Eye, 2 dozen that can be seen with binoculars along with others requiring telescopes. We were amazed to see so many beautiful objects in Sagittarius with binoculars: M22 globular cluster, M20 Trifid nebula, M8 Lagoon nebula, M25 open cluster and several more. M13 globular cluster, Andromeda galaxy, ET, Perseus double cluster, Pleiades open cluster and several double stars were also seen that night. The 2 objects hardest to see unless you really used your imagination were the North American

nebula and the Veil nebula. While relaxing in our lounge chairs, we also enjoyed seeing some meteors thanks to the Taurids. Before leaving we each received key chains which had the Kitt Peak logo, a compass, a

red light, and a whistle. In the future, PAS should probably schedule a binocular session for our members and the public, maybe at Mike's.



Binocular star party at Saguaro National Park: During a PAS Field Trip, many PAS Members enjoyed a trip to Tucson to visit several Astronomy related places in early November 2015. Facing the camera (L to R) Frank Insana (standing), Bob Ewing, Paul Facuna, Mike Marron and sitting down, Ted Blank. Photo by Sam

More Tucson Trip Photos & Reviews will be in the March issue.

Why Write a Review of an Event?

By Terri, Event Coordinator, Events@pasaz.org

When PAS does an event, whether hosting or participating, I usually send out a request, by email, for those who attended, to write a review for the newsletter. Why? Because, PAS would like to keep a historical record of the events attended. Your newsletter review (of any length) enhances reviews written by other PAS Members or "thank you's" from a school, or scout group. So, take a moment and write a review of any astronomical event, you have attended, especially if you felt really good about the event. Let other people know, and help maintain our history.

The other reason I ask for reviews is that having me as the only writer of reviews of events, can get kinda dull for the reader. I don't usually put humor into my reviews (but Darlene does), and I may forget some

details that the reader may wish to know about, so I ask that others give me their reviews so that we can make a really good picture of how the event went.

We include things like weather, seeing and transparency, as well as activities if it's not just a Star Party. Talk about who attended the event, tell us about the parts you really liked and give the reader something different to read with your personal touch. So if you have a moment to review an event, get the it to me by the deadline so it can be incorporated into the Newsletter with the other reviews about that same event.

One other reason we might want your input is if you did an event that was extremely awesome, and you want people to know about it so they attend the event with

you next time, such as a really spectacular viewing session at Antenna's site, then your review is the only way they will find out about this event and what a great time was had by the attendees. So, send those reviews to me. They can be as short as a few sentences.

As of the April 2014 Awards Ceremony, reviews that are added to the newsletter are considered Public Outreach & you can get an award for including your review in the newsletter. The top 3 PAS Members to write reviews for the Newsletter will be included in the NSN Awards. Reviews can be Reviews of an event, a phone app or computer program having to do with Astronomy or an Article written for the newsletter about anything else astronomy related. Send them to me today!



The Loneliest Galaxy In The Universe

By Ethan Siegel

Our greatest, largest-scale surveys of the universe have given us an unprecedented view of cosmic structure extending for tens of billions of light years. With the combined effects of normal matter, dark matter, dark energy, neutrinos and radiation all affecting how matter clumps, collapses and separates over time, the great cosmic web we see is in tremendous agreement with our best theories: the Big Bang and General Relativity. Yet this understanding was only possible because of the pioneering work of Edwin Hubble, who identified a large number of galaxies outside of our own, correctly measured their distance (following the work of Vesto Slipher's work measuring their redshifts), and discovered the expanding universe.

But what if the Milky Way weren't located in one of the "strands" of the great cosmic web, where galaxies are plentiful and ubiquitous in many different directions? What if, instead, we were located in one of the great "voids" separating the vast

majority of galaxies? It would've taken telescopes and imaging technology far more advanced than Hubble had at his disposal to even detect a single galaxy beyond our own, much less dozens, hundreds or millions, like we have today. While the nearest galaxies to us are only a few million light years distant, there are voids so large that a galaxy located at the center of one might not see another for a hundred times that distance.

While we've readily learned about our place in the universe from observing what's around us, not everyone is as fortunate. In particular, the galaxy MCG+01-02-015 has not a single known galaxy around it for a hundred million light years in all directions. Were you to draw a sphere around the Milky Way with a radius of 100 million light years, we'd find hundreds of thousands of galaxies. But not MCG+01-02-015; it's the loneliest galaxy ever discovered. Our Milky Way, like most galaxies, has been built up by mergers and accretions

of many other galaxies over billions of years, having acquired stars and gas from a slew of our former neighbors. But an isolated galaxy like this one has only the matter it was born with to call its own.

Edwin Hubble made his universe changing discovery using telescope technology from 1917, yet he would have found absolutely zero other galaxies at all were we situated at MCG+01-02-015's location. The first visible galaxy wouldn't have shown up until we had 1960s-level technology, and who knows if we'd have continued looking? If we were such a lonely galaxy, would we have given up the search, and concluded that our galaxy encompassed all of existence? Or would we have continued peering deeper into the void, eventually discovering our unusual location in a vast, expanding universe? For the inhabitants of the loneliest galaxy, we can only hope that they didn't give up the search, and discovered the entire universe.



ESA/Hubble & NASA and N. Gorin (STScI); Acknowledgement: Judy Schmidt, of the loneliest void galaxy in the known: MCG+01-02-015.

PAS Visits the Flandrau Science Center Nov 9

By Kevin Witts

On Monday November 9th, a group of PAS members visited the Flandrau Planetarium and Science Center on the campus of the University of Arizona.

Before the Flandrau tour began, PAS members were introduced to U of A's "Moon Tree". The Moon Tree is a sycamore tree whose seed was carried on a trip around the moon aboard Apollo 14 in February, 1971. Hundreds of seeds made the trip and those seeds were germinated when returned to earth. Saplings were then offered to colleges, schools and countries. The U of A sycamore has been there ever since.

The group was then treated to a planetarium presentation entitled "Touring the Solar System". The private showing featured gorgeous presentations of each planet, several key moons and the universe. Attendees were treated to a stunning representation of Earth and the Sun's magnetic fields and some interesting information about the constellations and exoplanets.

After the planetarium show, the group had a chance to experience the Center's presentations and exhibits, including some very challenging science puzzles. The tour ended in the basement of the Center and it's

fabulous Mineral Museum. This museum is a "must see" and features beautiful displays with hundreds of minerals, fossils and meteorites.



Mineral Museum. Photo by Sam.



Moon tree at Flandrau we have PAS Members standing in front of the tree (L to R): Bob, Paul, Frank, Vera, Mike & Kevin. Photo by Sam.



PAS at Kitt Peak. From L to R: Dewell Howell, Sam Insana, Earl DeLong, Ted Blank, Howard Moneta, Vera Streismeyer, Peter & Andi Turner, Kevin Witts (squatting), Paul Facuna, Mike Marron & Bob Ewing. Photo by Sam Insana.

Legacy Traditional School Nov 13

By Earl DeLong

When I arrived I had a little difficulty getting permission to enter. The weather was very nice (clear, no wind, warm). While I set up, the Fall Festival was in full swing with an estimated crowd of 2000. At 6:30 pm the festival started winding down and they announced that the telescopes were available for viewing. While setting up, our host provided pizza and water. The floodlights in the field were a little problem. After the festival, most attendees left without observing through our telescopes. I estimate I had 50 observers look through

my telescope. The students and parents were interested and polite. This is another fairly dark site once the floodlights were turned off. I would return to this location.

Eric Steinberg - I also had some difficulty both finding the venue (our GPS's seemed to think it was somewhere else) and finding the setup location. Once there, I began to set up, noticing that about 50 yards away from me sitting on a dusty dirt baseball diamond was a helicopter. I thought to myself "I hope he's not going anywhere",

but sure enough, we got 8 minutes notice that he was taking off! It was pretty crazy, scrambling around to get everything covered and tarped - which was a good thing since the helo produced a major dust storm. To add insult to injury, there was no wind and we sat for about 15 minutes in thick dust. Eventually I was able to set up, and though the mercury-vapor floodlights were not turned off until toward the end of the event, I was able to show M11 and Uranus to about 50 - 60 people.

Where Is The "Highest" Spot On Earth?

The highest spot on Earth all depends on what your definition of "highest" is. At 29,029 feet, Mount Everest is the tallest mountain above sea level. (Mauna Kea is Earth's tallest mountain at about 33,500 feet, with around 19,700 of that submerged beneath the Pacific Ocean.) However, be-

cause Earth is not a perfect sphere but an "oblate spheroid," one could define "highest" as being closest to outer space and not base-to-peak height.

There is a bulge that circles the Earth just below the Equator. Anyone/thing on

that part of the Earth is closer to outer space than those in other parts of the world. Mount Chimborazo, in the Andes, is a 20,000-plus-foot peak sitting on top of that bulge. Due to that placement, Chimborazo is the "highest" spot on Earth, about 1.5 miles closer to outer space than Everest.

Rock-a-Rama Solar Event Oct 30, 31 & Nov 1

By Terri, Event Manager

Several PAS members signed up to do Solar Viewing in Black Canyon City at High Desert Park, 3 days in a row from 11:00 am to 2:00 pm. The event had about 30 stands set up with rocks, minerals, jewelry and other fun stuff for sale. The view at the park, with the mountains near by, was absolutely gorgeous - even close-up in a telescope! Temperatures were varied but the winds at times were quite intense.

We were set up in the center of the parking area, while the other tents were set up in a horseshoe shape around the parking lot.

Oct 30: Friday started out with PAS members Terri Finch with table and handouts, Mike Marron with his meteorites, Don Boyd doing Solar through his scope, Sam Insana with his PST, and Ofelia Waters who was of great assistance the whole day with setup, take down and errands. We also had a visit from George Sabo, and Diane and Alex Vrenios during the event. We set up with only one PAS canopy because of the strong winds and within an hour, the top of the canopy blew off (along with five others), leaving us in the sun for the rest of the time. Luckily, it wasn't too hot that day. Mike said "People were just 'Blown Away' at this event."

About 100 people attended this day - not many visited our tent, but those who did, enjoyed the view of the Sun through the 2 scopes. My contact there was Susan Marley and she provided a cooler with ice and bottled water, which was very much appreciated.

Sam writes: "On Friday we showed a double solar prominence about 50 thousand miles high and about 40 thousand miles wide".

Oct 31: On this not-as-windy day we had William with his PST which turned out not to work. Luckily Kevin brought both his solar-capable scopes and shared. Kevin set up his 8" with a solar filter and his Lunt Solar Scope on the Sun. William and Terri, took turns helping Kevin manage the crowd that came to the scopes. Also in attendance were Mike with meteorites, Ofelia and Don (with solar scope). I did the PAS Table of handouts most of the day. Attendance at the event was about 300 patrons for the time we were there. After the event, Kevin, Don, William and I went to Rock Springs Cafe for dinner and pie. Happy Halloween!

Nov 1: Attending were William with a

small 4.5" scope, Mike with his meteorites, Kevin with two scopes, Terri with the PAS Table, Don without a scope, and Paul Facuna helping with setup and takedown. Kevin had his Lunt scope plus his 8" showing Jupiter, Venus, and then the mountain top which people really enjoyed seeing, if upside down.

Because the Moon was setting within an hour of setup, I went over to the raffle ticket booth where they had an air horn, and asked them to announce that people should come look before it goes behind the mountain. That got a crowd over to the scopes. I'd say total attendance was about 200 patrons on this day.

Many thanks to my telescope team. This event was exhausting, fun, hot at times, super windy at times, but we enjoyed it and got a lot of PAS info out to the public. Many thanks to Susan for inviting us to this event - she asked if we would do it again next year. In 2016 it falls on the weekend of Nov 4,5,6. I will get it set up and we can



Saturday, Lots of people walked by. There was not as much wind on this day, so it was hot in the sun but nice right under the PAS Canopy.

Photo by Sam



The Wind on was so strong on Friday Oct 30 at this event, it grabbed our Canopy and whipped it around. Luckily there were enough in attendance to grab the Canopy and put it away. We left the Frame in place to mark our area.

Photo by Sam.



Mike Marron was seen with his Meteorite Collection and shared with those who stopped by to chat at the PAS Table. Photo by Don.

discuss it at the next MOM's.



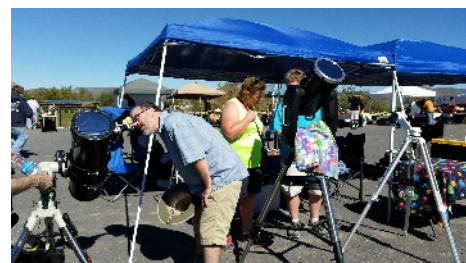
The Wind at the Rock A Rama Event in Black Canyon City on Oct 30, 2015, blew so hard, it took off our canopy. Luckily we had some cloud cover for the event. Photo by Don Boyd.



Kevin brought his Lunt (which he is standing next to) and his 8" with a Solar Filter (which Terri Finch is standing next to) for the event on Oct 30. Photo taken by Don.



We had a steady crowd of people drifting by the PAS Canopy. Activities included learning about PAS, Meteorites with Mike, Solar Viewing with Kevin Witts & Don on Sunday Nov 1. Photo by Terri Finch.



Three scopes were set up for the public to enjoy a view. For part of the time, the 8" of Kevin's was put on Jupiter & then Venus. Photo by Don.

Halloween Party in Carefree Oct 24

By Terri, Event Manager

This was a shorter party than last year's - the Moon being too bright for a star party. In attendance we had only PAS Members, but we had a wonderful dinner, a great costume contest, a movie and a TV show. William and Terri Finch, Sam and Frank Insana, Bruce, Ed, and Bette Wurst, Rodney Fong, Don Boyd, Paul Facuna, Eric Steinberg and Ora Kurland, Mike Marron (the Host of the party) and Kevin Witts were all there. After everyone stuffed themselves with great food, we had a birthday celebration (and cake) for Eric Steinberg.

We then had the costume contest. If you didn't come in costume, you were a judge and the costumed folk did not vote this time. We had 5 costumes, 4 to be judged, with the other 10 attendees voting.

Frank came as Austin Powers and did a very good rendition of him for his "costume dance." The better the Costume Dance, the more chances you have of winning the contest. Having a story, or something to go along with the costume also makes it more interesting for those watching the costume contest and voting. Sam came as Scotty, and brought his Tribble he had purchased from the Leprecon event this past summer. He came out and in Scotty's voice, convincingly announced something that brought back memories of my favorite episode of Star Trek. Then we had Mike come out in his costume from "The Martian" - he had on a space helmet and talked about various things in the movie. The 4th costume was William and Terri, as a team, who came out as "Browncoats." Browncoats are the rebels in the TV show "Firefly" and the movie "Serenity." William had a shirt with the words "You can't take the sky from me," (which are in the theme song of "Firefly"), and Terri had on a shirt of the spaceship Serenity hovering over a moving train, as the crew of the Serenity snags the TARDIS from the train. Please note, Doctor Who has nothing to do with "Firefly" or "Serenity," it is a mashup shirt.

You will have to attend the April 2016 Awards Ceremony in order to find out who won this costume contest. After the contest

and the winners were announced, the group decided to watch "The Trouble with Tribbles" Star Trek episode (to go with Sam's Costume). Then, we watched the movie "Serenity" (to go with William and Terri's costume).

After the movie, the party cleared out. A few hardcore members (Rodney, William, Terri and Don) stuck around to chat with Mike. Looking forward to the next

Halloween Costume Contest? We can plan it for Oct 29 2016 or Oct 22 2016 and both nights are dark sky nights, so we could include a star party. Plan to attend - put it on your calendar now. Many thanks to Mike for hosting this awesome event.



Sam Insana as "Scotty" in "The Trouble with Tribbles" episode of Star Trek. Photo by Don.



William & Terri Finch at Mike's Halloween Costume Contest on Oct 26 2015 in Carefree. This was a Team costume of "The Browncoats." Photo by Don Boyd.



Mike Marron as "The Martian." Photo by Don.



Frank Insana as "Austin Powers." Photo by Don.

Satellite Graveyard

Provided to PAS by NASA's Space Place

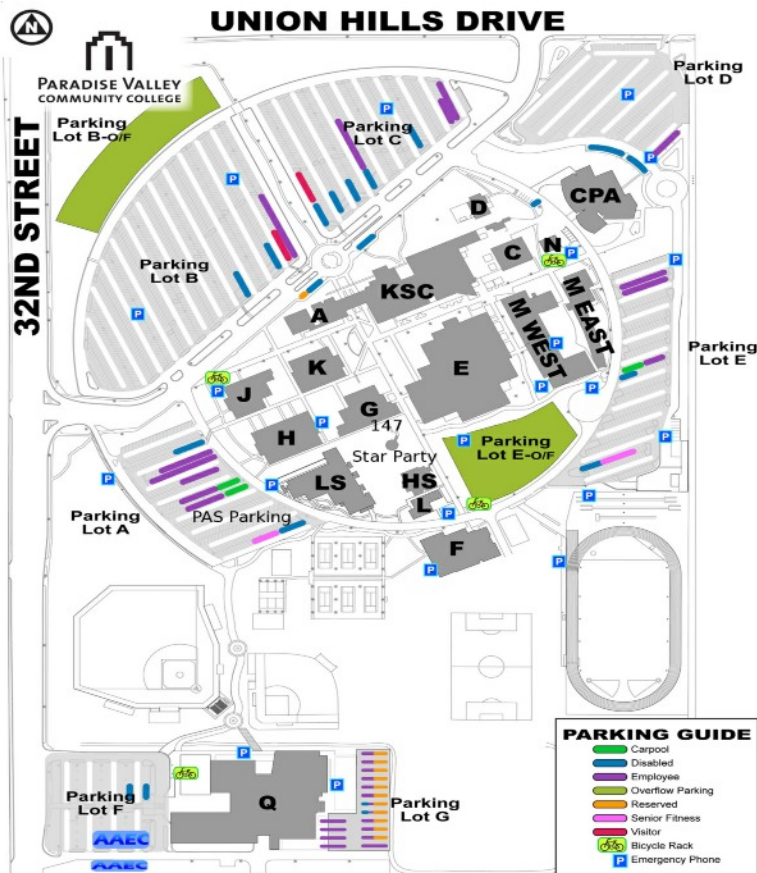
Where do old satellites go to die? Countries and commercial ventures have been putting spacecraft in orbit around

Earth since the late 1950s. There must be a lot of space junk out there. So what happens to them when they no longer work? Find

out <http://spaceplace.nasa.gov/spacecraft-graveyard> at.

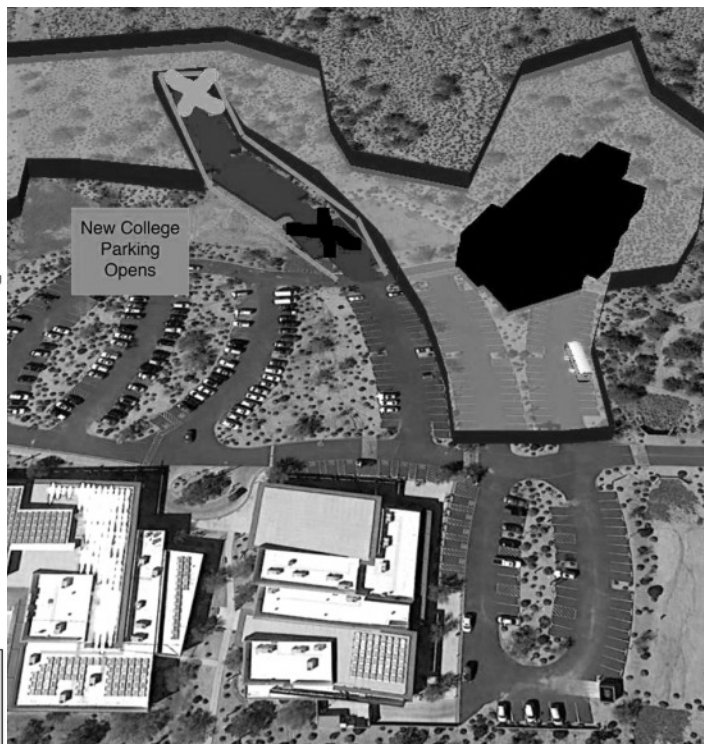
Map of PVCC Main Location

18401 N. 32nd Street | Phoenix, AZ 85032



Black Mountain Campus of PVCC

60th Street and Carefree Hwy
34250 North 60th Street, Scottsdale, AZ 85266



The lighter X is Scope set up. The dark X is PAS Parking.

February 2016

Sun	Mon	Tue	Wed	Thu	Fri	Sat
	1	2	3	4 PAS Meeting	5 School Star Party (Private).	6
7	8	9	10 Private Star Party	11 Public Star Party at BMC	12 School Star Party (Private)	13
14	15	16	17 School Star Party (Private)	18 Free Telescope Workshop	19 School Star Party (Private)	20 Public Solar Event at Library
21 Free Telescope Workshop	22	23	24 Private Star Party	25 PAS Meeting	26	27
28	29					

Don Boyd
PAStimes Editor
3039 W Peoria Ave 102-188
Phoenix AZ 85029

2015 PAS GUEST SPEAKER LINE-UP

By Terri, Event Coordinator, Events@pasaz.org

These meetings are held on Thursdays in Room LS-204, unless otherwise noted.

Do you have an idea for a Guest Speaker? Email me the details. Here are the scheduled Guest Speakers at PAS:

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

Feb 25 (Room LS-205): Special Meeting with Guest Speakers

Mar 3: David Williams: "Year of the Dwarf Planet: Dawn at Ceres and new Horizons at Pluto"

Apr 7: Elliott Rachlin "Usefulness of a Telescope Mounted on the International Space Station"

May 5: Dan Heim "Light Pollution: Where we are in 2016"

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Meetup.com - <http://www.meetup.com/Phoenix-Astronomical-Society/>

What's Up For February?

By Rod Sutter, PAS Past President

Planets

Name	Date	Rise	Set
Mercury	02-15-16	06:00	14:12
Venus	02-15-16	05:44	15:54
Mars	02-15-16	12:52	11:24
Jupiter	02-15-16	7:59	08:32
Saturn	02-15-16	02:40	12:48
Uranus	02-15-15	09:34	10:11
Neptune	02-15-16	07:52	19:09
Pluto	02-15-16	04:55	15:03

All Times Arizona Time

February 15 2015

Sunrise: 07:42

Sunset: 18:13



Q3: January 31



New: February 8



Q1: February 15



Full: February 22

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