

# PAStimes

Phoenix Astronomical Society  
[www.pasaz.org](http://www.pasaz.org)

September 2012  
Volume 64 Issue 1

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PHOENIX ASTRONOMICAL SOCIETY — ESTABLISHED 1948

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## September Member's Night Meeting in LS-205

By Terri, Event Coordinator

As some of you know, we hold a Member's Night for the September PAS meeting. This year, we would like to have anyone wishing to share their photos or videos of the Solar Eclipse or Venus Transit... at this meeting. Other topics are welcome as well. Sign up for 10 or 15 minutes of time to share those items with the attendees. I'd love to see them! The evening will be open to other topics as well, but this is a great way to start out our new PAS year! Let's

share our experiences from this summer's exciting events!

To sign up, send me an email, or call me with your topic by the day before the meeting. Then let me know if you need 5 or 10 or 15 minutes to talk about and share your photos, or topic. Once we have a full night of topics, I will not allow any more people to sign up, so sign up today! Any astronomy topic is welcome! You need not fill 10 minutes if you don't have 10 minutes

of material. And please try not to exceed 15 minutes to allow others to share what they have, too. See you there! Many thanks to Alex for coming up with this idea.

Alex Vrenios writes: I've got a "slide show" of the 1st through 2nd contact points of the Venus Transit from June 5th.. It's about one minute long. I'll show it at the September meeting. \*\*\*

## NEW PAS Meeting Location for Fall 2012

By Terri, Event Coordinator

PAS has a new meeting location. For the PAS General Meetings, 1st Thursday of the Month, with Guest Speaker and for the PAS Meeting of the MInds, we will now

(starting in September) be meeting in the Life Sciences Building in room 205 (LS-205) for the Fall 2012 Semester (September - December meetings). Both of these meet-

ings are parties, so bring a snack to share. Drinks will be provided as bottled water. BYO drinks, if you do not desire water. Bring a friend! See you there! \*\*\*

## Many Many Thanks to Mike Marron

by Terri, Event Coordinator

I'd like to take a moment to thank Mike for all the events he held this summer at his home. And for all the future events that are lined up to be at his home through 2012 and 2013. It is wonderful to have a PAS Member who not only likes to hold events at his home but also lets me schedule so many of them. We have a bunch of events happening that everyone will want to attend, public and private. And without Mike, his home, his dark sky location, we couldn't have these awesome events. Many thanks to Mike for sharing his home & his dark sky location with the club. Thank you Mike!

Bob Senzer writes: As a PAS member who cannot attend meetings on a regular basis, the events at Mike's Hacienda, have allowed me to stay in touch with PAS and the circle of friends within PAS. I would like to thank Mike for his hospitality in hosting these events.

Joe Collins writes: We have enjoyed Mike's hospitality on several occasions at his 'Cow Track Ranch' home. Whether it be a star-party, movie-watching, potluck or one of his astronomy or physics lectures, we have enjoyed him being host and opening his home to us and his many MENSA and

PAS friends. My daughter Katerenna enjoys watching movies and socializing with the children of Mike's friends. My wife Renee enjoys getting away to Mike's place because it is quiet, western, rustic...and we can socialize longer than at VI after PAS meetings. Of course, I like the camaraderie of Mike, PAS members and many of Mike's friends who are memorable characters in their own right (you know who I am speaking about). Of course, I enjoy Mike's informative lectures, and the 'peanut gallery' heckling him during the lectures as well. I just wish we could make it more often. Mike, Thanks a lot!\*\*\*

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## Upcoming September PAS Events

By Terri, Event Coordinator, [Events@pasaz.org](mailto:Events@pasaz.org)

Upcoming events list: <http://www.pasaz.org/forums/downloads.php?do=file&id=49>

**Sept 6:** PAS Meeting - Member's Night. Bring a snack to share, water provided by President: Bruce. Sign up to do a 5-10-15 minute presentation on anything Astronomy related, including your fun experiences with the Solar Eclipse of May 20 and the Venus Transit of June 5. We meet in LS-205 at 7pm.

**Sept 11:** CTCA (Private) 7pm to 9pm. RSVP with Joe. PAStimes Star Tour Members only.

**Sept 15:** Mike's Private Dark Sky Star Party. 5pm Potluck. 7pm Star Party. RSVP is with Mike for this event. Details are in the PAS Calendar. PAS Members only. Bring a

main dish & drink to share at the potluck. Bring your telescopes.

**Sept 20:** FREE Telescope workshop & Star Party at PVCC Main Campus 7pm to 10pm by Telescope Dome & G-147. PAS Members may use the 6" Dobs provided by PVCC for the Star Party. I do suggest PAS members bring their own eyepieces for better views. RSVP with Terri is required for the Telescope Workshop. When you RSVP, please include what type of scope you need assistance with & how many are in your party.

**Sept 22:** International Observe the Moon Night party in Carefree. Bring your friends & family. Everyone Welcome. Potluck is at 4pm. Bring a main dish & drink to share at the potluck. RSVP is required with Mike [Primefactory@q.com](mailto:Primefactory@q.com) or 480-488-3031.

**Sept 25:** CTCA Back up date for Sept 11.

**Sept 27:** PAS Meeting of the Minds. Meet in LS-205 at PVCC Main Campus, 7pm to 10pm. This is a Party meeting so bring a snack to share. Water provided by our President. This meeting is based on topics. If there aren't enough topics to hold the meeting, the meeting is canceled.

**Sept 30:** Bookmans FREE Telescope Workshop 3:30 to 5:30pm. RSVP required with Terri [Events@pasaz.org](mailto:Events@pasaz.org). Bookmans is at 19th Ave & Northern, meet in Musical Instrument section of the store. Please provide type of scope & number in your party, when you RSVP.

**Oct 4:** PAS Meeting 7pm to 10pm PVCC Main Campus LS-205. \*\*\*

## Antennas Star Party June 16

By PAS Members

Tim Jones writes: Our Saturday night DOM deep sky observing trip (not a "star party") to the Antennas site turned out to be a great close on an otherwise frustrating Winter season in the Phoenix, Area. Eric and Ora started things off in setting up the trip with Dewell, Bob and I, and Albert all joining in.

Albert arrived first and the rest of us followed with Bob and I arriving last. It was rewarding that the heat of the day had started to subside when we began setting up and it was not as bad as many of us feared it might be. Even though we heard from our in-town connections that Phoenix proper had been besieged by winds, clouds, and haze, things were very clear out west.

The evening arrived with Saturn, Spica, and Arcturus appearing as the first visi-

ble objects in the sky. Eric shared Saturn and many of her moons with us through his 16" Dob before the sky had fully darkened and that was a great precursor to the rest of the evening's viewing. Bob, Albert and I (all using goto mounts) were able to align and configure things in time to catch a beautiful Mercury crescent dipping into the Western horizon. Our next target was Omega Centauri of which Bob, Eric and I were able to pull out of the southern horizon. As we tracked it through the early evening, Eric was able to really show it off in his Dob with a 20MM, 100° AFOV Plossl eyepiece. It was an almost religious experience.

The Summer Triangle and Scorpius were the next to rise and we watched as Scorpius crept over the hills to the south of our setup area throughout the evening until

the full tail was visible around 01:30. Pegasus and his "Great Square" was soon to follow and targets of opportunity were numerous. The list of available targets was huge and we all did our best to enjoy as many as our time at the eyepiece allowed. Even Bob, who's on a mission to find faint and fuzzy planetary nebulae, took time away to enjoy some of the more "ordinary sights" with M17 (which both he and Eric shared with OIII filters) being a big highlight. We watched Cassiopeia rise in the north a bit after 23:30 and we all roamed from eyepiece to eyepiece to enjoy the various objects. As the night progressed, the breeze from the ENE started bringing some of the haze from the Phoenix area out our way and the seeing softened a bit in that direction starting around 01:00.

# CTCA/PAS SkyTour Event May 15

By Joe Collins, PAS/CTCA Liaison

Attendees: PAS members: Eric & Ora Steinberg, Joe & Renee Collins and Mike Marron. We cancelled solar viewing due to heat, and instead Mike Marron had a meteorite display indoors with two attendees. We had four more for a total of six attendees [three patients, three care-givers]. Five of them joined us at the CTCA 5th floor garden terrace for the evening SkyTour event.

Conditions: Even though today's date would have been perfect for solar viewing (there is a lot of sunspot activity), the national weather forecast issued an excessive heat watch warning until 8pm Tuesday evening. So, instead, for the patient's comfort we had Mike Marron, our meteorite man, display part of his meteorite collection indoors in the Cafe. We ran the regular evening program from 8:30-10:30pm.

Equipment: Eric: 16" Meade Light-

bridge Dobsonian telescope with 9mm Explore Scientific eyepiece. Joe Collins: Celestron CGEM 11" SCT, binoculars & iPad.

Eric Steinberg <eric@ytdept.com>: Our star presentation started out unseasonably hot (107 degrees) but gradually cooled off to more pleasant temperatures by the time we finished up. During the evening I showed Saturn, Mars, Venus (briefly), the double-star Mizar, M81/82 and M5 to five (as always) appreciative customers. In spite of the heavy light pollution, seeing was excellent and Saturn in particular showed a sharp, stable image in the 16" scope with Cassini division and ring shadow clearly visible.

Joe Collins <jcollins79@cox.net >: During the course of the evening we viewed all the objects listed and described in our event handout: For examples: we viewed

Mars, Saturn & Saturnian moons in the Eastern sky. I shared views of Cor-Caroli, iota-Cancri, Polaris, Sirius, Rigel, Mizar/Alcor and several other lesser known binary/multiple stars, the core of M31 Andromeda galaxy, the Eskimo nebula, the 'Stargate' asterism, the M3 globular cluster, the Pleiades (M45), the Praesepe/Beehive (M44). We (Patients, Caregivers, PAS members) continue to be amazed at what we can see despite city light pollution...

We extend our thanks to Marisa Benincasa of CTCA for advertising, printing out our handouts and for meal tickets. We also thank the CTCA hospitality staff for providing refreshments, especially the ice cold water this time! Thanks! Thanks to PAS members who attended for working and volunteering their time to make this event a success and enjoyable for CTCA patients and caregivers! \*\*\*

## Antennas Star Party June 16

*Continued from page 2*

In addition to visual observing, Albert and I spent time working with our Canon DSLRs - he took advantage of the Frys special on the T3i - and both had levels of success and failure. I'm still sorting through my hits and (mostly) misses.

We all made it through until around 02:30 with Bob and I making it through until Astronomical Twilight at just a bit past 03:35. I spent the night under the stars and woke up around 4:40 to witness the 3 day old Moon and Jupiter sharing the Eastern horizon. Unfortunately, I was so in awe of the sight that my logical brain never kicked in to actually photograph the scene. Albert got a shot or two and we're waiting to see how they turn out.

Awakening fully a bit after 05:30, we all noticed that a haze had moved into the area announcing the arrival of the first of the monsoons - the ridge line to the west that was glorious in the previous evening's sunset was completely masked in haze and nearly invisible in the rising Sun. As we packed to leave Sunday morning, Dewell commented about how much more relaxing the outing had been because we weren't having to battle the cold and the bugs. All of us felt very rewarded with the evening's efforts, Eric got to 109 of the 110 Messier objects, Dewell uncovered many objects that he'd been chasing, and Bob is now 21

objects closer to his goal of 110 objects in the Astronomical League's program. Me? I just enjoyed the amazing objects I saw through my and other's scopes.

Until next Fall ...

Eric Steinberg writes: A dark-sky observing session was held on June 16th at the Antennas location. In attendance were: Tim Jones, Bob Christ, Eric and Ora Steinberg, Albert Tucker and Dewell Howell. Skies started out pristine with excellent seeing and some beautiful views of Omega Centuri, the Trifid Nebula, the Lagoon Nebula and M17 (Swan Nebula). After midnight the wind shifted to the east and skies were not quite as clear; by 2 AM they were downright murky. Daylight showed why - a heavy fog of dust lay over the whole area, almost all the way back to the Valley. Overall a good night of viewing though.

Albert Tucker writes: Review and Lessons Learned: This was my first trip to the Antenna site. The area is large enough to accommodate PAS. The seeing was not exceptional because of the dust storms east of the site, but it was still better than the best conditions in the Phoenix area. I arrived at the site first and was skeptical until I saw the outline of rocks leading into the area because there were so many areas to choose from. I parked, checked my coordinates, got out of the car and enjoyed the cool

breeze for a while, then I realized the coordinates posted on the website were different. After a few cell phone calls I was relieved to find out that I was at the correct location and the coordinates listed were for a location on the other side of the antennas. Set up went well, mount worked as planned, stopped to get another drink and noticed that my water jug was getting low, oh well no problem I thought, I had a small backup container. First lesson, bring more water.

Watched as others worked hard to level the ground and move some rocks, then I noticed the tents going up. I was prepared to stay up the entire night and enjoy the stars, Ah, lesson number two, sleep will win. Luckily I could fold down the seat and nap in the 4-runner. We saw wondrous and beautiful Messier objects too numerous to mention, and some special views that were spectacular, as one quoted "almost religious" it was so beautiful. There were so many stars it was difficult to locate the ones that I normally used for guidance in Phoenix. After an early morning nap the moon and Jupiter were visible in the early dawn. The pictures I sent of the view did not do it justice. We loaded up and said good bye. The drive back to Phoenix revealed the devastation of the dust storm that affected our seeing, we were very lucky that it did not reach us. \*\*\*

# Public Star Party at PVCC May 31

By Terri, Event Coordinator

Many thanks to the Telescope Team from the May 31 Public Star Party at PVCC. Sam Insana, Don Boyd & Tim Jones brought their scopes. Also attending was Chet Schuler, Sonny Schug, Dave Hellman was there for a little while, Eric & Ora Steinberg were there, Jenny Weitz, and Kevin Adams (PVCC). Many thanks to those who provided snacks. Mel Cantrell attended the event, and joined PAS! He also brought a thing of brownies that was very appreciated. William Finch and I brought Chex Mix, and Sam brought Popcorn. I also was able to acquire a case of bottled water, provided by Bruce, President, in his absence. There were 6 RSVP'd families who never showed up. This was an awesome evening for viewing, as the skies were totally clear, and the temperatures, although a bit warm, was comfortable due to a small breeze. We considered doing a Meeting of the Minds, but when asked, the group didn't seem to have anything they wanted to discuss. So, we socialized while waiting for the daylight to leave, so that people would show up for the star party. When people didn't show up, we closed up the event at 9pm. Thanks to all who attended. Let's have a great event, repeat of this event on

June 28th. Photos of this event can be seen at this link:

[http://www.pasaz.org/forums/gallery.php?g2\\_itemId=11257](http://www.pasaz.org/forums/gallery.php?g2_itemId=11257)

Sam Insana writes: On Thursday evening May 31st, we had a star party at PVCC from 7 to 9 pm. About 12 PAS members showed. 3 members brought telescopes: Don, Sam and Tim. Although several people of the general public rsvp'd with Terri, none showed up. Even though summer school was in session, none of the students dropped by to look through the telescopes. Sam was able to show our newest member, Mel, 4 objects with his 8 inch newtonian telescope: Saturn, the Moon, M13, and Cancer Iota double star. Mel told Sam about his new binoculars and some nice objects he has seen, like M6, M7 and the Orion nebula. Most of the PAS members spent the evening inside in the air conditioning, to avoid the 100 degree outside temperature. Several people brought snacks: Sam brought popcorn, Mel brought brownies, and the Finches brought chex mix and water bottles. It is suggested that we not have the PVCC star parties in June, July and August, because of the poor turnout and hot weather.

Mel Cantrell, New PAS Member, writes: Last night was rather enjoyable. Being a new member to the club I actually was not sure what to expect. Although I have attended other star parties with this group, this case was special because I had become a member. The group was extremely inviting and very friendly which gave me a sense of belonging. Terri went out of her way to make me feel like a part of the group. I then sat back and watched the rest of the group interact. For me this was most enlightening. By nature I am a people watcher and can generally get a good feel for the group just by observing. What my observations showed was that the group was fairly close knit and enjoyed themselves being together. I also got a sense that the knowledge in that group, once I tap into it, would take a lifetime to accumulate. Later, I was able to go and observe through Sam's scope. Sam was very engaging and showed me several new sights I would otherwise have missed. He offered information on what we were seeing and how he was able to find them. For me the night was a success. Although for the group, being a public star party with no public, it fell short.

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# Bookmans Telescope Workshop June 3

By Terri, Event Coordinator

Bookman's Telescope Workshop this time was a wild event! Somehow, PAS got in the AZ Republic with an ad about this event. And so, we had a turnout of 12 RSVP's telescopes. But that wasn't it.... there were more than 12 in attendance, as some of them didn't RSVP. Many thanks to those who attended & RSVP'd: Andy Traylor, who brought his 10" Dob, Virgil Foltz who had a Venture RX-7, Bil Hougen with his Celestron Nexstar, Albert Keith with his 10" Dob, Ellen Lavato with her Star Explorer, Charles Black who is a school teacher and wants to set up a star party with PAS, Jane Elliott with her Celestron AstroMaster, Emil McDonald, Duane Sommers with his 60mm, Emil Switzer with his Meade 3" Refractor, Patricia Miller with her Meade ETX 90, Joe Portnoy (extra), Martin Pearl with his Nikon Spotting Scope, Bill Nelson (extra), Byron Woolley (extra), Tina Aileron who wants to buy a scope, and L. Porter who wants help. That's 18 people in attendance with 12 scopes who RSVP'd, only

one didn't show, and some extra people.

I am so glad we had the help of Don Boyd, Eric Steinberg, William Finch, & Rod Sutter. Sue Sutter attended too and watched over my stuff where she was sitting. It was a very productive, exhausting event. Instead of helping anyone in particular, I walked around, told everyone what was going on, mentioned the teachers we had available (Eric, Don, William, Rod) and assured them, we'd get to them soon enough. I also explained that we normally have a cut off of 4 scope maximum but because we were listed in the AZ Republic newspaper, I allowed for everyone to attend this time. That got most of them to patiently wait their turn, rather than having to come back for a different telescope workshop. Each one saw a Telescope Teacher, one on one, and we were done about 4:45pm with all of the scopes. Then we sat there, waiting until 5:30, in case the lady with the binoculars showed up. She did not, so we packed it up at 5:30.

Many, many thanks to the Telescope Teachers, and to Kevin Adams (PVCC Student) who took photos of this event for me. The photos will be available in the PAS Photo Gallery soon.

Rod Sutter (Past PAS President) writes: Sunday was a great day for our Telescope Class, we had a great turnout. This is just a reminder to anyone who reads this. I talked to a lady who bought a Telescope for the family. She spent around \$800 for a small scope. I told her she would be better off to sell the scope and buy a good DOB. You could imagine what kind of DOB she could get for \$800. I hope I didn't discourage her but I did show her how to setup and operate her 127mm Mak. We did have a lot of people with scopes, and the biggest thing we always tell people, but it's usually too late, come talk to us, look through our scopes, ask us lots of questions, and then decide which scope is right for you, don't go just anywhere (Fry's, Wal-Mart, etc) to buy your Telescope, since

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# Bookmans Telescope Workshop June 3

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there are not shops in Phoenix that sell Telescopes any more, you'll have to buy it online, just from a reputable dealer, ask us who we would suggest. The thing I like about Orion is they have real people you can talk to if you have an issue with your scope, I heard not good things about Meade or Celestron's customer service, while Orion still has a real person to talk to. So before you go out to spend lots of money on a scope, PLEASE, PLEASE, come talk to us and get some input about your purchase before you buy that scope, get frustrated with it and then put it in a closet for the next

??? years. We will get you up and running and give you pleasure with your scope, not frustration.

Kevin Adams writes: A large crowd attended to both learn about their own telescopes and to see demonstrations of how to set up/tear down their equipment. Some members offered advice for eyepiece upgrades or mounts for better viewing enjoyment. Terri heavily advertised the Venus Transit event this upcoming Tuesday, where PAS would be camped out at PVCC's Black Mountain to watch the once-in-a-cen-

tury event. I attended and took several photos of the this event.

Eric Steinberg writes: Sunday afternoon at Bookman's brought a great turnout of folks with telescopes and telescope questions. I worked with four or five people ranging from a gentleman with a 10" Orion tube on an Atlas EQ-G mount to a young lady with her first scope, a 70mm Celestron refractor. I did a lot of finder-adjusting, collimating and general instruction, along with advice on what to look at in June. All in all, a very successful afternoon.\*\*\*

## PAS-CTCA SkyTour Event June 12

by Joe Collins, PAS Member & CTCA CancerFighter™

We had another successful CTCA/PAS SkyTour Event last night for n=12 attendees: 6 patients, 6 care-givers, all adults. PAS members working the event were: Eric Steinberg, Don Boyd, and Joe Collins. Ora Steinberg, Renee Collins and Laurice Dee volunteered.

Weather & Such: AccuWeather.com forecast was accurate. It was a clear non-turbulent night and cooled down to the high eighties soon after sunset making the evening comfortable. The weather remained pleasant throughout the evening SkyTour event from 9-11pm. We got a 'free show' from six or so skyhawks flying overhead during their 'feeding time', a couple of small aircraft doing "touch 'n goes" at the nearby Goodyear airport and there were even a few Magnesium flares visible above/behind the Estrellas.

Early Solar Viewing: Not this time. We canceled solar viewing due to forecast excessive heat 104° and 'Migraine weather' for Goodyear. Albert Tucker will bring his solar scope for solar viewing at the next event, July 10th.

Night Time SkyTour: Here are some words about the evening from PAS attendees:

Don Boyd <azphotog@gmail.com>: I showed Saturn, M3, M4, M5, M6 (the Butterfly Cluster), Albireo, Alcor and Mizar, and Pollux which the Autostar catalog says is a very wide double as opposed to being a binary star. I confirmed Pollux is a double star with some older catalogues and found out that Pollux has a Jupiter-class planet. My Newtonian telescope and eyepiece se-

lected for the night had just the right field of view to appreciate the stars outlining the wings of the Butterfly Open cluster.

Eric Steinberg <eric@ytdept.com>: Tuesday's star tour at CTCA started off hot, but thankfully not as hot as forecast. Skies were also pretty stable which afforded some of the best views of Saturn I've seen. In addition to Saturn, I was able to show the double star Albireo, M5, M13, M92, M11, M6, Omega Centuri (very washed out in the light pollution to the south), M81/M82, and M57 (Ring Nebula). We had about 12 viewers who all seemed to really enjoy the presentation.

Laurice Dee <launchspace@msn.com>: "One of the highlights of the 12 June CTCA SkyTour Event is the enthusiasm on the part of the cancer patients when all of us took to the night sky through telescope viewing. The patients were quite intrigued with the various celestial objects, and I was most happy to volunteer my time to make their evening a very positive one. Events like this truly reinforce my love of solar system exploration, astronomy, and night sky-watching. I truly enjoy reminiscing the great time that all of us had, and I am already looking forward to the next telescope-viewing event at the CTCA!"

Joe Collins <jcollins79@cox.net>: It was a good night for Dark Sky Objects (still atmosphere and moonless until after the event finished), but Saturn stole the show. I was able to share and show patients, care-givers and other PAS members more objects than we profiled on our event handout.

Saturn and its moons: Titan, Tethys, Rhea, Dione, Hyperion, and Iapetus, were the most popularly requested objects tonight. Of the other solar system objects, in addition to Mars, we were also able to spot Mercury just before it set behind the White Tank mountains. It was not dark enough to view the occultation of Pluto. Still, it was a very good night for viewing binary and multiple star systems: Polaris, Albireo, Cor Caroli, Mizar/Alcor, iota-Cancri, and 35-Com. We spotted several galaxies but couldn't resolve them due to limiting urban background lighting: M81/M82 looked like two small streaks and M101 looked like a small spot, too-faint to impress our customers. Of the planetary nebulae, we viewed the Ring Nebula M57 and a barely visible Cat's Eye Nebula. We viewed M3, M5, and M13 Globular Clusters-faint at 9pm, these objects looked spectacular after 10pm. We viewed one of my personal favorite asterisms: the Stargate cluster, and the following open clusters: Praesepe (Beehive) M44, M6 (Butterfly Cluster) and M11 (Wild Duck Cluster). The Wild Duck Cluster was impressive towards the end of the event. We ran out of SkyTour Objects handouts this time! Laurice handed out info on the Cassini-Huygens Solstice mission and the JPL Solar System Ambassadors Program. Websites: <http://www.jpl.nasa.gov/cassini/mission/introduction/> and <http://www2.jpl.nasa.gov/ambassador/>

Among the PAS membership, I want to thank Laurice Dee PhD, JPL Solar System Ambassador for observing and volunteering with us.

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# PAS-CTCA SkyTour Event June 12

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We want to thank Marisa Benincasa and Jennifer Kehren of CTCA for meal tickets (dinner was great!), for printing out our handout flyers and publicizing the evening's event. We also want to thank the CTCA hospitality crew for bringing up refreshments: ice water and an assortment of bakery cookies. As always, we want to thank CTCA for the opportunity to share the night sky wonders with patients, caregivers, and their families and we look forward to returning next month!

Laurice Dee writes: One of the highlights of the 12 June CTCA SkyTour Event is the enthusiasm on the part of the cancer patients when all of us took to the night sky through telescope viewing. The patients were quite intrigued with the various celestial objects, and I was most happy to volunteer my time to make their evening a very positive one. We all saw Saturn, various Messier objects, and some prominent stars. La Luna - in her waning crescent phase - did not rise until after I hit the freeway on my

way home from the event. She could not have been more beautiful! I love when La Luna keeps me company whenever I am on the road!

Events like the Venus Transit and the CTCA SkyTour truly reinforce my love of solar system exploration, astronomy, and night sky-watching. I truly enjoy reminiscing the great time that all of us had, and I am already looking forward to the next telescope-viewing event at the CTCA!\*\*\*

## Bookmans July 8 Review

By Terri, Event Coordinator

The day began with 4 scopes attending. Don Boyd said he couldn't make it to this event, so I needed someone with a collimator. I sent out an email and attending this event as Telescope Teachers was Eric Steinberg, Albert Tucker & Rod Sutter. So many, many thanks to those three PAS members for helping out. Extra PAS Members to attend were Ora Steinberg, Sue Sutter, William & Terri Finch, Kevin Harcey, & John Pulis. Kevin Adams, from PVCC, brought along his camera and shot a bunch of photos which will be found in the PAS Photo Gallery.

I'd like to thank all the attendees at this event, who RSVP'd and attended: Amber Ingram, her husband Mike & Son (114mm Meade), Greg Kaplan and Serena Easton (Celestron 127 EQ Power Seeker), Darlene Ahlefeld (What scope to buy?), Craig & Celeste Adamson (6" dob), Sheila Altenbernd & Tracy Liley (Orion Sky View Pro

8" Reflector), Eric Hoag (What scope to buy?), Jason O'Connell (What scope to buy?), & Yves Klein & his wife (who showed up 1/2 way through the event to join PAS).

I'd like to welcome 3 new PAS members from this event, see article about that in this newsletter issue.

Eric assisted Craig & Celeste. Many thanks to Albert who assisted Sheila & Tracy for most of the event. Rod did a wondrous job helping Amber & Mike, and Serena & Greg. After everyone left around 4:30, the PAS group relaxed for a few minutes before Yves showed up. We asked him to bring in his scope, and he said he couldn't carry the 24" into Bookmans. So, we sat and talked with him and his wife for another 1.5 hours. We departed from Bookmans around 6:15pm. Mike is going to have a crowd at his July 21 Event! Most of these folk wish

to attend, and are bringing awesome food for the potluck.

It was a very successful event! Attendance was 16 public & 5 telescope teachers, 4 additional PAS Members & 1 PVCC student / photographer. Thanks to all!

Kevin Adams writes: After exiting the ten-million degree parking lot, I stepped inside Bookman's to find my good friends from PAS waiting for me. We talked about our 4th of July week and shared laughs about our stories. When business came (aka customers) I began my photographic duties and we all had a lot of fun discussing astronomy and the workings of telescopes with the customers.

Sheila Altenbernd writes: Thanks Terri. We enjoyed the event immensely. Albert was a big help to us. We learned a lot. I'm hoping to come to the star gazing event as well. Thanks again for hosting this. \*\*\*

## Mike Lecture Party #1 July 21

By Terri, Event Coordinator

It began with a nice, leisurely drive up from Sams Club with Kevin Harcey in the car with William and me. We arrived 5:30, earlier than I had anticipated. Already in attendance was Frank Insana and Mike Marron, our Party Host. A few moments later, after we got parked, Darlene Ahlefeld arrived. The group started to show up. Amber Ingram, and her party of two arrived (Mike & Aiden), Sam Insana, Jason O'Connell & Guest, & Mikey Webb. Right about 6pm, the storm hit. It was a nice lightning show with a slight rain at first, that then became blowing wind and rain. It last-

ed about a half hour and was a great start to our party. Of course, this meant there would be no stargazing for this event. But the attendees didn't seem to care. Then, we had a few more folk show up. Eric & Ora Steinberg attended and a new couple, Jim and (I'm sorry, I don't recall her name).

So, we enjoyed dinner and I wish to thank those who brought main dishes. It was an awesome dinner. There was hummus, fried chicken, a creamy nacho sauce, many types of chips, sloppy Joes, salsa, a veggie tray, a meat tray (meat wrapped around cheese sticks - yum), many types of

drinks, and plenty of bottles of water. Many, many thanks to the those who brought food. We all ate until we were content and then Mike's friend Joe shows up at the party.

Amber and I were talking about how they were outrunning an Haboob on the way up to Mike's. The drive up for us (Kevin, William and I) was uneventful and dry. We could see the storms off in a distance but were not experiencing them, other than wind. But, Ambers cell phone was putting out a storm warning signal, many times through the night.

*Continued on page 7*

## Mike Lecture Party #1 July 21

Continued from page 6

7:30 we were about done eating, but were still chatting and Mike wanted to start the lecture. He was setting it up. I mentioned to him that we scheduled the lecture for 8pm and due to some people who might have wanted to attend the lecture but not the potluck, we should hold off until 8pm in starting the lecture, which was the planned, scheduled time. So, we did. The lecture began.

Mike did an awesome presentation. It was short... only 1 hour long. That amazed many of us who were prepared for a 3 hour lecture. The topic "Earth Shattering Evolution." It was a great presentation covering the many craters found on the Earth and to which death bringing / destruction bringing

meteorite may have caused the destruction.

When the lecture concluded, many of the attendees left. We then turned our attention to enjoying a bad movie (this seems to be the routine). We watched "The Last Sentinel," which wasn't worth watching, but Sam, Kevin and Mike were enjoying picking apart the movie. Mikey and Frank hung out in the kitchen chatting through that movie. Then when we finished that one, Kevin wanted to watch "The Black Hole," so we started it up but decided on no volume, as a conversation began in the living room that overtook the movie. However, some of us watched or viewed the movie while we chatted. And some of us, like me, dozed off (got up too early that morning).

The volume wasn't up enough to hear it. We mostly had it on to talk about the weird Electrical Entity in the movie.

When the second movie was done, it was 2am. The only people left were Mikey, Mike, Frank, William, Me, and Kevin. We chatted for about an hour more and then loaded up and left. William and I got to bed about 4am.

I wish to thank everyone who brought the awesome food. I wish to thank all of those who attended even though they knew there was a storm coming. I also want to thank Mike for hosting the party and doing a very good lecture. Next event like this, hopefully without the rain, is Aug 18. See you there! \*\*\*

## Mike's Fireworks Party July 3

By Terri Finch, Event Coordinator

The evening began with running around like headless chickens to get to Mike's house at the start of the potluck. Once William and I grabbed the pizza & ice cream, we were on our way. Potluck was to start at 6pm. We arrived at Mike's at 6:02pm. Sam & Frank Insana were already there. The potluck table had ribs, mashed potatoes, coleslaw, baked beans, pasta salad, 2 bags of chips, & salsa already out and the three of them were eating. We brought in our Sardella's pizza and added it to the collection. Then we started eating. The food was awesome. Don Boyd showed up and brought baked beans. For about 1.5 hours, it was only the six of us. We were wondering if anyone else was attending. Eventually, with the ribs cold, the pizza cold, Sam suggested that if anyone wanted to finish off the ribs, we should. So, Frank and I

enjoyed the rest of the ribs. Then it got to be after 7:30 and Mike had put on the movie "9." Around 8pm, Ryan and Kevin Harcey joined us. Kevin brought a Rotisserie Chicken and home made salsa. Some of us watched the movie until 8:30 when Mike suggested we start taking our chairs outside to enjoy the fireworks. We set up the chairs, took out the ice cream drumsticks, one per person. It was dark, but no fireworks were happening. Then, Mikey Webb showed up in his truck. I directed him to the house, he grabbed his cooler to sit on and joined us down the end of the driveway. The fireworks were awesome. Three times we thought it was the finale, but they continued for about 20 minutes total. There was a breeze during the fireworks, and no rain. Joe, Renee & Kat collins showed up right after the fireworks. It was good to see them.

The party continued for several hours, eating, drinking, talking, enjoying each others company. Around midnight Sam left. Around 1am Kevin & Ryan left. Around 2am Joe & family left. And it was 3am before William, me, Don, and Mikey departed. Got home about 4am and slept the next day until 11am. It was a great party. Many thanks to Mike for hosting the party. Many, many thanks to all the food that was brought and to Mikey for bringing the bottled water. We look forward to next year's event! Watch for photos of this event in the PAS Photo Gallery on line.

Mikey Webb writes: The event last night was very enjoyable. I had a great time, good conversation, beautiful night skis and spectacular fireworks. Thanks to All.\*\*\*

## Many Thanks to Kevin Adams

By Terri, Event Coordinator

Some of you may have noticed that PAS has a photographer at our events. This started one night at PVCC. Kevin Adams, a student of PVCC, was at our telescope workshop event and started taking photos of different things. I asked him to provide me with the photos for the PAS Photo Gallery and that started the collection you will be enjoying from Kevin, as I get them all posted into the Gallery. Kevin loves to take photos and has photographed many of our events starting the beginning of 2012. I

hope to have his photos available for our enjoyment as you visit the PAS Photo Gallery. And I thank him so much for attending and being a part of PAS events and helping us to keep an historical record of our events through photos. Please, take a look at Kevin's photos in the Bookmans events of June 3, 2012 and July 8, 2012. As well as at the Venus Transit held at PVCC. More photos will be posted, so keep checking back at the Photo Gallery. And thank you Kevin! \*\*\*

## Fun Facts About Curiosity

The latest spacecraft in NASA's Mars Exploration Program is the Mars Science Laboratory, carrying a rover named Curiosity. Launched on November 26, 2011, MSL arrived on Mars on August 6, 2012. The landing site was Gale Crater, a meteor-impact crater that was chosen because it has many signs of the past presence of water.

# Meeting of the Minds July 26

By Terri, Event Coordinator

In attendance: Editor: Don Boyd, President: Bruce Wurst, William Finch, Vice-President: Terri Finch, Sam Insana, Frank Insana, Jason O'Connell, Treasurer: Mike Marron, Dave Hellman, Darlene Ahlefeld, Eric & Ora Steinberg & Chris Johnson.

We opened the meeting with 2 long overdue awards presented by Bruce to Dave Hellman and Chris Johnson. Then we turned the meeting over to Don to run the voting part of this meeting.

1) Proposed change to the Constitution to change the name of the PAS Constitution from Constitution to PAS By-laws. This was voted unanimously as a YES.

2) Bookkeeping: Proposed that the current amount of \$200 for which the Treasurer may write checks in this amount without additional signatures on the checks, be raised to \$500 because our dues to the Astronomical League alone are in excess of \$200 per year. Majority voted YES to this proposal, with one against.

3) A discussion was started about adding a few more voting positions / Officers to the club for legal reasons. Since we needed 2 more members to be Officers and we didn't want to assign them to do anything in particular, yet be there in a voting capacity at the voting meetings, 2 members of PAS were voted in as Members At Large,

and these two members are Dave Hellman and Mikey Webb. Congratulations for taking on this position within PAS. Mike will also serve as a backup Host for the PAS Meetings in John Pulis's absence. They were voted in with the following terms. Dave is taking a 1 year term, with the option to renew his position in May when we vote in the new officers of PAS. Dave's term will then be a 2 years term, going forward. Mikey is taking on a 2 year term to start, with each election continuing as a 2 year term. This way, we only need to elect 1 new Member at Large, per May Meeting PAS Election day. The choice of Members at Large was voted in unanimously.

We also agreed that the PAS Past President position becomes a voting position. The job of the Past President is to help the new President for their first year (Rod Sutter, Past President, helps Bruce Wurst, last year's new president), to know the ropes of being President. After that first year, Rod may keep the title of Past President until another New President takes over, and then Bruce becomes Past President and must share the responsibility of President for 1 year to assist that new President.

The floor then turned to a few announcements from Dave Hellman. 1: the PAS Podium & A/V cart need to find a new home. Bruce offered to pick it up and store

it at his place for now. 2) Dave is hosting a Ham Radio Club that is open to anyone. If you are interested, please contact Dave for more info. 3) Scopes donated to PVCC are now being donated to PAS. Bruce will pick those up, as well, and prepare them for use by club members.

Then, the evening turned over to Chris and what Chris did a presentation having to do with the editing of the PAS website, for which Don and I were assigned different aspects of the site so that we can do the editing and Chris can sit back and take all the credit. Ha ha ha ha. Anyway, Don and I have been wanting access so that Chris doesn't have to be bothered every time something needs to be changed on the site. So, we were taken through how to do the editing and given ability to do so. We also, as a group, helped Chris figure out what part of the site we would like changes made to. We created some new emails, we fixed a few things on the site, and we gained access to making changes. Now, those of us with the access need to practice using the editing abilities without messing up the site. That took us up to 10pm. It was a very informative evening. Thanks to all who attended and learned more about PAS. There are a few more items to be voted on, so watch for a special meeting to be called, to accomplish this task. And we hope to see you at that meeting. \*\*\*

# Bookmans Telescope Workshop of Aug 5

By Terri, Event Coordinator

I wish to thank the two RSVP 's who shared their time with us at this event. James McDaniel and Bo Bolinaga. Bo brought his 120mm reflecting telescope in for Don and William to talk about and review. He also brought his Bushnell binoculars. James didn't bring in his telescope but stuck around the whole time with questions

and seeking info. I do hope we assisted each of them. They left content with the info we provided. It was a fun event. In attendance from PAS was William & Terri Finch, Don Boyd, Kevin Harcey, and we had the photography expertise of Kevin Adams from PVCC. Those photos will be found in the PAS Photo Gallery. Thanks to all the PAS

members who were there to support this event. And many thanks goes to Yvette, my contact at Bookmans, for posting in the Bookmans flyer, both August Bookmans Telescope Workshops. That was a nice surprise to see on their flier. Next event at Bookmans is on Aug 26. See you there! \*\*\*

# Many Many Thanks to Joe Collins

By Terri, Event Coordinator

Joe is a PAS member who has shared in the responsibility of setting up and coordinating events. The events that Joe has been in charge of are the events at the Cancer Treatment Centers of America (CTCA). These events have been happening on a monthly basis, and Joe has been a very awesome liaison between PAS and CTCA in coordinating the events, moving then

when the weather isn't so great, and making sure we fulfill our part of the agreement (once a month star party at their location). I wish to thank Joe for assisting in keeping these events running smoothly, and in coordinating the workers and volunteers from PAS who assist with the events. Thank you so much, Joe! You are doing a find job and I definitely appreciate it! \*\*\*

# Welcome New PAS Members

By Terri, Event Coordinator

Welcome new PAS Members: Yves Klein, Steven Rasbach, Darlene Ahlefeld, Jason O'Connell! Welcome back, returning member Sonny Schug! We hope to see you at many of our events! If you didn't already get the Welcome pack named "Get the Most from PAS" please drop me an email so I can get you set up as a new PAS Member! \*\*\*

# Planets For September

By Leah Sapir

We have a nice lineup of planets this month, although some of them will require us to get up early (or stay up late). Saturn and Mars are in the southwest after sunset, forming a nice triangle with Spica at the beginning of the month. Saturn and Spica will be sticking together all month (as they have been doing for most of the year), but Mars will gradually be drifting eastward. Saturn and Mars will both set around 9 pm at the beginning of September. Towards the end of the month, Saturn sets around 7 pm, but Mars will be up till 8:30.

Neptune and Uranus are at opposition. Neptune will be in the east at sunset, and Uranus rises a bit later. Both will be up for all or most of the night.

Jupiter rises around 11:30 pm at the beginning of the September, but will gradually be rising earlier, and will be visible as early as 10 pm by the end of the month. It makes a nice triangle with the Pleiades and Hyades for most of the month.

Venus shines like a beacon in the east from the time it rises, around 3 am, throughout the month of September. Venus is currently in its half-phase, moving towards gibbous. It will be passing in front of the Beehive Cluster around the middle of the month, with the closest approach on September 12-14.

Mercury will be too close to the Sun to be visible this month. In October it will be an evening star.

The third-quarter Moon will pass by the Pleiades on the morning of September 6 from around midnight to dawn, moving towards the Hyades on the following morning, and passing by Jupiter on the morning of September 8. It will pass by Venus and the Beehive Cluster as a waning crescent on the morning of September 12, from around 3 am to dawn. Then, following the new moon on September 16, the waxing crescent Moon will appear between Saturn and Mars in the early evening sky of September 18, and closer to Mars on September 19.

Saturn will soon be disappearing from our western sky in October, to reappear the following month as a morning star. Since Saturn is so far away from the Sun – an average distance of 9.6 a.u., about 900 million miles – it doesn't seem to vary much in size in different parts of its orbit. Its visual diameter varies from around 19 arc sec at opposition (as it was in May of this year), when it is around 8.7 a.u. from us, to 15 arc sec when it is on the far side of its orbit, around 10.8 a.u., as it will be in October.

Mars, on the other hand, exhibits more variation in size from our viewpoint, due to both its greater proximity to us, and its elliptical orbit. Saturn's orbit varies from 9.05 to 10.12 a.u., a difference of about 5% from the average value of 9.58 a.u. The orbit of Mars, on the other hand, varies from 1.38 a.u. at perihelion to 1.67 at aphelion. While this might not seem like much (a total difference of about .29 a.u. compared to

Saturn's difference of a whole a.u. between perihelion and aphelion), when we compare it to the average value of 1.52 a.u., it gives an eccentricity of about 9%. Moreover, when a Mars opposition (its closest point to Earth) happens to coincide with its perihelion, as it did in August 2003, Mars can be as close as .4 a.u. from us – only around 37 million miles. At a time like this, Mars can have a visual diameter of 25 arc seconds. This close approach occurs about every 15-17 years. In the middle, Mars oppositions are progressively farther from us. For example, at the most recent opposition (March 2012), Mars was .7 a.u. from us, around 60 million miles, and its visual diameter was around 14 arc sec. We'll have a similar situation at the next opposition, in April 2014; then Mars will start to get progressively larger at each opposition, till the next close approach in July 2018.

Currently Mars is moving towards the far end of its orbit; it is around 1.8 a.u. from us (about 170 million miles) and has a visual diameter of 5 arc sec. At its farthest point it will be about 2.45 a.u. from us (230 million miles), with a visual diameter of just 4 arc sec.

Although Mars is moving away from us, it will be staying in our evening sky for another few months. It will fade into the sunset next March, and reappear a month later as a morning star, beginning its trek back towards opposition.

## More Fun Facts About Curiosity

The Curiosity Rover, recently landed by NASA on the surface of Mars, can roll over obstacles up to 29 inches high, and move at a speed of up to 295 feet per hour. Its expected average speed will be about 98 feet per hour, depending on the terrain. The rover's power supply generates electricity from the radioactive decay of plutonium. This power supply will enable the rover to explore the surface of Mars for at least one martian year (687 Earth days).

NASA reports: "The Mars Science Laboratory, which landed on Mars on August 6, 2012, is part of a series of expeditions to the red planet that help meet the four main science goals of the Mars Exploration Program: determine whether life ever arose on Mars; characterize the climate of Mars; characterize the geology of Mars; and prepare for human exploration."

## SCOPE FOR SALE

Celestron NexStar 8i - This "go-to" scope is signed by John C. Dobson and David H. Levy - Includes: tripod & spreader, 120v/12v transformer, original & upgraded computerized control, 9x50 Orion finder scope, Telrad star finder, 90 degree diagonal, solar filter, eye pieces: 9 mm -16 mm -25 mm -32 mm-40 mm with case, instruction manual, storage case. Asking \$839 for this great value. Call or email Peg at 602-653-1580 or [wocabird@gmail.com](mailto:wocabird@gmail.com) \*\*\*





# Queue Observing at Mt. Paranal

By Dr. Marc J. Kuchner

First a caravan of white observatory cars arrives, winding up the narrow road to the 2600-m- (~8500-foot-) high summit. Then the shutters around the domes open, and rays from the setting sun alight on colossal mirrors and metal struts. It's the beginning of another busy night at Mt. Paranal, Chile, where I am learning about new, more efficient ways of managing a modern observatory.

I stepped into the observatory's control room to soak up some of the new, unfamiliar culture. Here, under florescent lights and drop ceilings are banks of computer screens, one bank to control each of the four big telescopes on the mountaintop and a few others too. At each bank sits two people, a telescope operator and an astronomer.

The layout of this workspace was not unfamiliar to me. But the way these Mt. Paranal astronomers work certainly was. When I was cutting my teeth at Mt. Palomar observatory in California, I would only go to the telescope to take my own data. In stark contrast, everyone observing at Mt

Paranal tonight is taking data for someone else.

The Mt. Paranal astronomers each spend 105 nights a year here on the mountain performing various duties, including taking data for other astronomers. The latter, they call "executing the queue." Headquarters in Germany decides what parts of the sky will have priority on any given night (the queue). Then the Mt. Paranal astronomers march up the mountain and carry out this program, choosing calibrators, filling the log books, and adapting to changing conditions. They send the data back to headquarters, and from there it makes its way out to the wider astronomical community for study.

This new way of working allows the Mt. Paranal astronomers to specialize in just one or two telescope instruments each. Surely this plan is more efficient than the old-fashioned way, where each of us had to learn every instrument we used from scratch—sifting through manuals at 3:00 AM when the filter wheel got stuck or the

cryogen ran out, watching precious observing time tick away. Here at Mt. Paranal, much of the work is done in a big room full of people, not off by yourself, reducing some dangers of the process. Also, queue observing cuts down on plane travel, an important step for cutting carbon emissions.

It's a brand new age, I thought as I watched the giant domes spin in the silent, cold Chilean night. And maybe with queue observing, some of the romance is gone. Still, my colleagues and I couldn't help saying as we stared out across the moonlit mountains: I can't believe how lucky we are to be here.

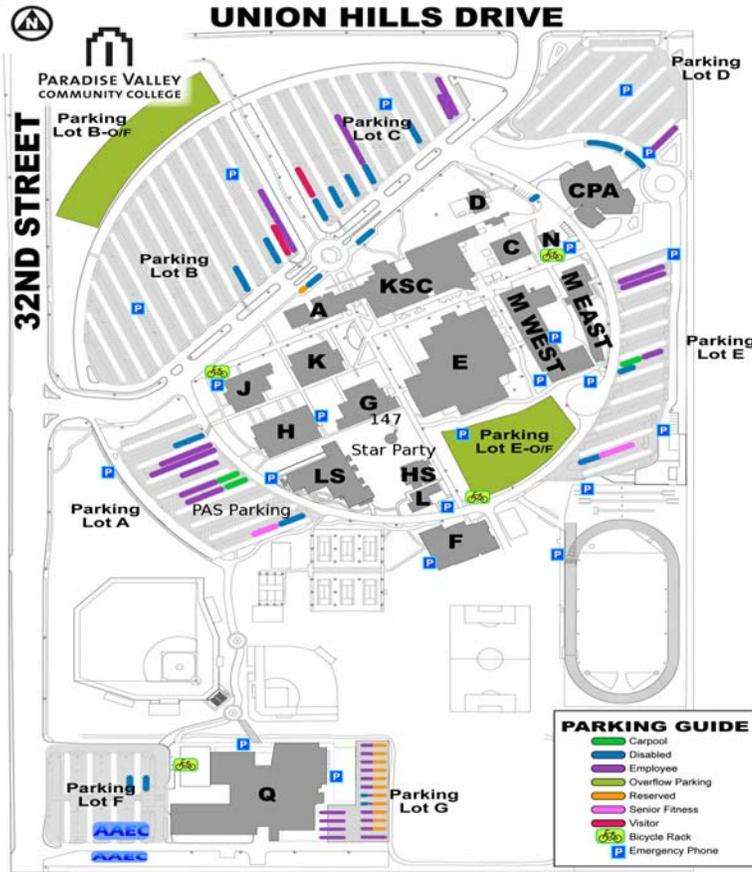
Dr. Marc J. Kuchner is an astrophysicist at the Exoplanets and Stellar Astrophysics Laboratory at NASA's Goddard Space Flight Center. NASA's Astrophysics Division works on big questions about the origin and evolution of the universe, galaxies, and planetary systems. Explore more at <http://www.science.nasa.gov/astrophysics/>. Kids can explore these topics at <http://spaceplace.nasa.gov/space>.



European Southern Observatory at Mt. Paranal, Chile.

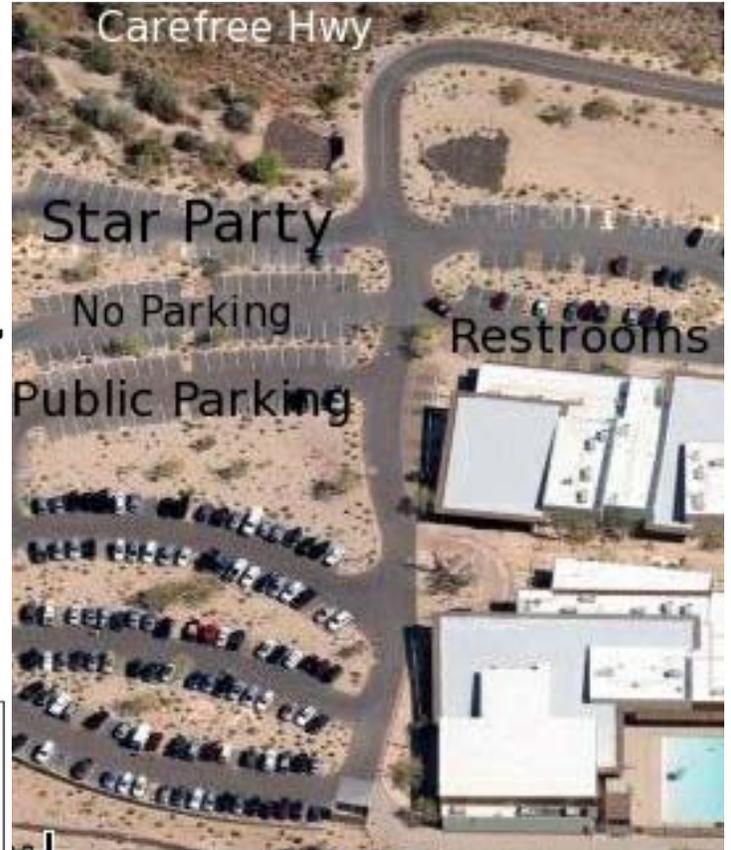
### Map of PVCC Main Location

18401 N. 32nd Street | Phoenix, AZ 85032



### Map of PVCC Black Mountain

34250 N. 60th Street | Scottsdale, AZ 85266



See page 2 for more details

## September 2012

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
						1
2	3 Labor Day	4	5	6 PAS Meeting All Welcome	7	8
9	10	11 CTCA (Private)	12	13	14	15 Mike's Private Dark Sky Star Party
16	17	18	19	20 FREE Telescope workshop & Star Party	21	22 International Observe the Moon Public party
23	24	25 CTCA Backup	26	27	28	29
30 Telescope Work-shop at Bookman's						

Don Boyd  
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To:

## Birthday Party Sept 15 at Mike's!

By Terri, Event Coordinator

At the Sept 15 Dark Sky Star Party for PAS Members, we will be holding a very special Birthday Party for John Pulis, who on Apr 13, turned 90 years old! Come celebrate with us! \*\*\*

### 2012 PAS GUEST SPEAKER LINE-UP

By Terri, Event Coordinator Events@pasaz.org

Do you have an idea for a Guest Speaker? Email me the details.

Oct 4: Dan Heim "Atmospheric Optics"

Nov 1: David Williams "Asteroids, Ion Propulsion, and NASA's Dawn Mission to Vesta"

Dec 6: Mike Marron "Earth Shattering Impacts" \*\*\*

PAS is incorporated in the state of Arizona as a non-profit, scientific and educational organization. Our newsletter PAStimes is published monthly from September to May and distributed by US PS and the Internet. All Issues are available for download on our website [www.pasaz.org](http://www.pasaz.org) Ads for astronomy equipment are provided as a courtesy to sellers and buyers, and do not constitute any endorsement by PAS. All Photos by Don Boyd unless otherwise credited. All articles and photos are copyright their authors or PAStimes.

### What's Up For September

By Rod Sutter, PAS Past President

Name	Date	Rise	Set
Mercury	09-15-12	06:59	19:27
Venus	09-15-12	02:36	17:42
<b>Mars</b>	<b>09-15-12</b>	<b>11:37</b>	<b>20:43</b>
Jupiter	09-15-12	22:12	14:25
<b>Saturn</b>	<b>09-15-12</b>	<b>09:45</b>	<b>20:26</b>
Uranus	09-15-12	19:23	08:04
<b>Neptune</b>	<b>09-15-12</b>	<b>18:30</b>	<b>04:40</b>
<b>Pluto</b>	<b>09-15-12</b>	<b>15:32</b>	<b>00:11</b>

All Times Arizona Time

September 15 2012

**Sunrise: 05:29**

**Sunset: 19:38**

**Full: August 31**



**Q3: September 8**



**New: September 15**



**Q1: September 21**

