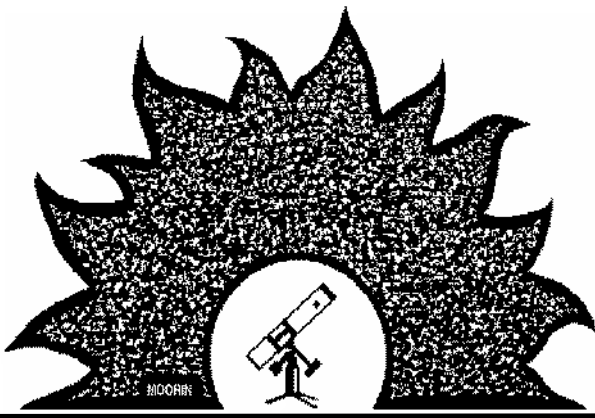




PAStimes

Phoenix Astronomical Society

www.pasaz.org

April 2015

Volume 66 Issue 8

PHOENIX ASTRONOMICAL SOCIETY — ESTABLISHED 1948

Dolores Hill to Speak at Apr 2 Meeting

Provided by Dolores Hill

OSIRIS-REx Asteroid Sample Return Mission to Bennu: Approaching New Frontiers: The Origins Spectral Interpretation Resource Identification and Security - Regolith Explorer (OSIRIS-REx) is an exciting NASA New Frontiers spacecraft mission that seeks to answer important questions about the origin and evolution of the early solar system. To be launched in 2016, its prime objective is to return and analyze a pristine sample from the surface of the carbon-rich near-Earth asteroid Bennu in 2023. In addition, we will map topography, mineralogy, and chemistry, measure orbit deviation caused by non-gravitational forces, and compare observations made at the asteroid to ground-based observations.

Amateur astronomers are important partners in the field of asteroid science, from making much needed follow-up observations of newly discovered NEOs to conducting ongoing observations of little-known asteroids. They are able to provide better geographic coverage and are able to observe more often than professional astronomers who have limited access to observatory instruments. Observations submitted to OSIRIS-REx citizen science program Target Asteroids! aid the OSIRIS-REx mission science team, future missions to asteroids, and our understanding asteroids potentially hazardous to Earth.

Bio: Dolores is a member of the OSIRIS-REx Com- (Continued on [page 3](#))



PAS Meeting Mar 5

By Terri, Event Coordinator

The March PAS meeting was super! We had a great guest speaker, a tasty line up of snacks, and new people in attendance.

Sam Insana brought 2 flavors of popcorn, Bob Senzer brought cookies, Bruce Wurst brought bottled water, donut holes and other cakes and cookies and Paul Facuna brought the nuts, which disappeared quickly without a trace, like a ninja. It was all yummy! I'd like to welcome new member Diann Smith and to thank William, Norm and Bob Sweet for attending as guests. We had a few brief announcements before turning the floor over to Alex Vrenios. Mike Marron announced that he attended a rock and gem group the previous week and did a presentation about his meteorites. Paul Facuna did a brief show and tell on the meteorite he picked up at the Gem

and Mineral Show. It was mounted, into a wood frame with glass and a nice display. Bob Ewing talked about the Science Fun that was happening at Black Mountain Campus of PVCC on Mar 12 before the major star party PAS was doing. And Sam Insana announced that on page 28 of the Mar 2015 Reflector (which all PAS members are receiving quarterly) in the section of "Herschel 400 Observing Program", No. 517 is Eric Steinberg! Congrats Eric!

I noticed that many PAS members were very tired this evening, including me, but Alex Vrenios, our guest speaker kept our attention, engaged the audience, and really did a fantastic presentation about parallax called "You're So Far Away." Alex's voice wasn't sounding so good, like he needed a big hot drink, but he made it all



Alex sharing his "You're So Far Away" presentation at the March PAS Meeting.

Photo by Don Boyd.

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April Upcoming Events

By Terri, Event Coordinator, RSVP to Events@pasaz.org

Apr 2: PAS Meeting in Room LS-205, Doors open at 7pm, Meeting starts at 7:30pm. Read about the Guest Speaker on page 1 in this issue. Everyone welcome. Bottled water provided by President Bruce. Bring a snack to share.

Apr 8: CTCA Private Star Party - PAStimes Star Tour Members Only

Apr 9: PAS Awards Ceremony (Private- PAS Members only)

Apr 10: School Star Party in Phoenix (Private)

Apr 12: Free Telescope Workshop at

Bookmans, 19th Ave and Northern in Phoenix - 3:30pm to 5:30pm. RSVP is required with Terri. 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.

Apr 16: Huge public star party at Black Mountain Campus of PVCC & STEAMtastic event, 60th Street and Care-free 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=1393&day=2015-416&c=1>

Apr 17: Private Star Party in Phoenix - PAStimes Star Tour Members Only

Apr 22: CTCA Back Up Date (Private)

Apr 24: School Star Party in Surprise (Private)

Geminids Meteor Shower Viewing Dec 13

By Sam Insana

Frank and I observed the Geminids on Sat night, Dec. 13th from the South Rim of the Grand Canyon. It was cloudy, but between 8 pm and 8:30 pm it was clear to the north and east. We saw 10 meteors in 30

minutes, 8 big long bright ones and 2 short ones. They all seemed to come from the northeast, which is where the Gemini twins were shining bright just above the horizon. The outside temp was about 30 degrees and

there was about a 15 mph wind. Thanks to the hot chocolate we brought in a thermos, we lasted the 30 minutes, then the clouds closed in for good.

(Continued from page 1)

the way through.

We wound up the meeting early with Pete winning the raffle. Congratulations Pete! Several of the group stayed after all

the rest left, to chat in the room until about 9:40pm when we all decided it was time to go home.

We hope you can attend the next meet-

ing as we have an exciting speaker coming to us from Tucson. You don't want to miss this presentation as Dolores always does a fantastic talk. Would love to see you there on Apr 2.§

PAS Meeting Mar 5

Scope for Sale:

Telescope TASC0 #11TRsm, \$80. Used only a few times. Excellent condition complete with all parts and user manual. Email inquiry to awrbkr@yahoo.com, or telephone Barbara at 480-201-4902

Dolores Hill to Speak at Apr 2 Meeting

(Continued from page 1)

munication and Public Engagement team. She is co-lead, with Carl Hergenrother, of the Target Asteroids! citizen science program of NASA's OSIRIS-REx asteroid sample return mission and Target NEOs!, an Astronomical League observing program. In June 2013 she and Target Asteroids! were honored as a White House Champion of Change for Citizen Science. Since 1981 Dolores has analyzed a wide range of meteorites at the University of Arizona's Lunar and Planetary Laboratory (LPL) and provided technical support to LPL space missions. Near-Earth asteroid (164215) Doloreshill is named after her.

Dolores belongs to the Meteoritical

Society, International Meteorite Collectors Association, and serves as Meteorite Section Coordinator for the Association of Lunar & Planetary Observers. She is a longtime member of the Tucson Amateur Astronomy Association, co-founded the Sunset Astronomical Society in Midland, Michigan and was a member of the Warren Astronomical Society in the Detroit-area. She has observed long period variable stars with the American Association of Variable Star Observers and chased grazing occultations with the International Occultation Timing Association.

Originally from the Midwest, she has a lifelong interest in amateur astronomy and

enjoys sharing the excitement of meteorite research and the OSIRIS-REx mission through talks and providing hands-on meteorite opportunities for school groups, astronomy clubs, and special public events. She looks forward to seeing samples of near-Earth asteroid Bennu in 2023!

Terri, Event Coordinator adds: Dolores is a long time friend of PAS. Her presentation will be awesome no matter what the topic. We look forward to having her at this meeting and having you attend as well. Bring a snack to share! Bottled water will be provided by President Bruce. §

Telescope Workshop at Bookmans Feb 8

By Terri and Various Attendees

We had a massive turnout at this event. I am so pleased with the attendance of everyone who RSVP'd, as well as the telescope team members. Many thanks to all!

This event's telescope team members were: Kevin Witts, William and Terri Finch, Rodney Fong, Pete Turner, Don Boyd and Howard Moneta. Additional attendees were Bob Senzer and his friend Eric.

We had Marcus Hermann attend with his Orion XT10i. Rodney, Pete, and William assisted him. Erica Edelstein and Brian Eaton attended with their Orion Sky Quest XT8. Don and Howard assisted them. Welcome new PAS members Erica and Brian!!! We had Tanja attend with her Celestron AstroMaster 114, and Kelly Atkin and her daughter Sage attended with their Selsi Newtonian F8.7. Don, Pete, William and Howard all assisted with this little orange scope. George Zukauckas, who became a PAS member at the last telescope workshop, brought his Mead LT8 and Kevin assisted him with his Autostar go-to system. Josie showed up. She came to find out about what scope to purchase and told us she is aiming for a degree in Astrophysics. William, Kevin and I assisted her. Zane and his Dad were walk-ins - I gave them some data and invited them to sit in on the conversations. Alex and Leslie also were walk-ins at this event.

After the Telescope Workshop, the group went to Carlos O'Brien's Mexican Restaurant for dinner together. Attending dinner were Kevin, William and Terri, Rodney, Pete, Don, Bob and his friend Eric.

It was a great dinner with great people! See you at the next Telescope Workshop at Bookmans on Mar 1.

Tanja writes: Terri, sorry I missed your message before we attended today. I emailed my telescope make and model about a week ago. Howard was messaging me on here. Thank you for putting this together! I have been too intimidated to go to other gatherings in the past since I am such a novice. Everyone was so nice! I won't be able to attend very often -but I am planning to return. Thank you!

Marcus writes: Hi Terri and Don, thanks again for the workshop. It was very helpful. Using Don's input from the workshop, I've been able to fix the secondary mirror "non-roundness". Rotating it did the trick (plus re-collimating afterwards). I think I accidentally rotated it out of position when I played around with the axis position of the secondary mirror some time back. I hope everything is as it should be, now.



Kelly's scope is being worked on by William (L) and Pete © with the assistance of Kelly's Daughter, Sage, in on the other side of the scope. Photo by Terri.



Erica & Brian are assisted by Rodney at the Bookmans Telescope Workshop.

Photo by Terri.



Tanja & her son are assisted by Howard during this workshop. Photo by Terri.

PAS Social 2015 Jan 31

By Terri, Event Coordinator

Jan 31 was the date to have on your calendar for the most awesome PARTY OF THE YEAR! I wish to thank everyone who made this event a success!

In attendance, PAS Members only, we had Eric Steinberg, Ora Kurland (Eric's wife), Paul Facuna, Mike Marron (hosting the party at his home in Carefree), William and Terri Finch, Ed, Bette and Bruce Wurst, Don Boyd, Sam and Frank Insana, Vera Stiesmeyer (Sam's wife), Rodney Fong, Kevin Witts, Howard Moneta, Alex Vrenios, Bob Senzer, Earl and Anita De-Long, Pete and Andi Turner, and Al and Cindy Smith. That's 24 in attendance!

The evening started with a 4pm setup. Many thanks to Rodney, Don, William and Mike for helping me. Rodney had arrived about 3:30 followed by the Finches at 3:40pm. Don arrived about 4:30pm and the guests started arriving about 5pm.

We had a most awesome dinner at 5:30pm - excellent with many choices. Many thanks to everyone who brought food to share! Ora provided baked mushroom-cheese borekas that were extremely delicious, Paul brought baked chicken, fruit and soda, William made Carolina Reaper Salsa and provided chips - super HOT Spicy, with a Hazardous Materials sign near it. Terri brought her famous pinto beans; Ed and Bruce brought pizza and dessert; Don brought baked apples; Sam provided the strawberry cheesecake for Frank's birthday and BBQ ribs; Rodney provided dessert; Kevin brought sliced beef that was heavenly, 2 different salads and Dreamsicle Jello; Howard brought green beans and corn; Alex brought hot dogs, buns and the fixings; Anita provided bratwurst, buns and fixings; Pete brought Apple Pie and Pumpkin Pie. It was so delicious, all of it! Dinner concluded about 6:15 with a celebration of Frank's 27th Birthday. A "27" candle was put in his cheese cake - he blew it out and we sang Happy Birthday. He was given a huge birthday card signed by everyone in PAS and a smaller 3D card with some cash, provided by the Finches. We all enjoyed it, or tried to fit it in (the cheese cake).

Then the activities began. Bruce set up the dart game outside with 4 boards to rotate everyone through the game more quickly. The temperature was decent, though a bit chilly with a brief interruption for some sprinkles. I brought the easels,

white board, marker and eraser - Bruce and Ed ran the game. The players were: Bruce, Terri, Ed, Don, Alex, Kevin, Mike, Howard, Frank, Eric, Ora, Sam, Paul, Pete, Andi, Earl and Anita. I believe we took 4 rounds through the players at the darts before calling it done. Many thanks to: Alex for providing the spotlight to light up the area, Ed for providing the dart boards and darts, Bruce and Ed for keeping this game going smoothly. While the dart game was happening out back, we had a bean bag toss in the living

room run by Sam. Sam had a bean bag catching board he put on the floor and each person was given a shot of 4 bean bags to get in the hole. Various points were awarded depending on where your bean bag landed. This was a fun game and I hope to do it again at next year's social. Many thanks to Sam for keeping score and running this game. I believe we took 3 rounds through the players, for this game before calling it done. Playing this game was just about everyone: Frank, Vera, Sam, Don, Howard, Kevin, Alex, Earl, Anita, Mike, Bob, Terri, William, Pete, Andi, Eric, Ora, Bruce, Ed, Bette, Paul and Cindy.

Then we moved inside and set up for the trivia game. Everyone at the event played.



It started out a gloomy day, then, while we were enjoying the Potluck Feast, it rained a little. Bruce set up the Dart boards, had to take them down again, due to rain, then put them back up before we could play the game. Photo by Don.



Frank opens his huge card from all of us, for his 27th Birthday. (L to R) Andi (wife of Pete), Rodney, and way in back Cindy, Howard, Sam with video camera, Terri, and Pete looking away.



Happy 27th Birthday Frank! It was a delicious strawberry cheese cake at the PAS Social. Photo by Alex.

PAS Social 2015 Jan 31

The subject, keeping in the theme of the evening, was Science and Astronomy (and for this game Sci-Fi was included). Kevin was the Game King and did a fantastic job - thanks Kevin! The game worked like this: Captains of each group were chosen, so the most knowledgeable of players (as far as Astronomy) were chosen. We had 5 Teams: Team Mike, Eric, Earl, Peter and Sam. Those captains then chose up to 5 players for their teams. Kevin provided 3 questions for each round with a halftime question and a final question. There were 6 rounds in the game with a lightning round at the end, after Team Mike and Team Sam tied. Kevin provided prizes for the 1st place, 2nd place and 3rd place teams.

Then we moved on to the Dry T-shirt Contest, hosted by Alex. Alex provided 1 prize for 1st place in the main category. The categories were: (Main) 1. Appropriate to the Science and Astronomy theme of this night, 2. Funniest, 3. Most Geek-ish, and 4. Best Graphics. Many thanks to Alex for hosting this activity. There were 10 contestants: Sam, Vera, Alex, Pete, William, Mike, Frank, Howard, Kevin and Terri.

We then moved to the White Dwarf Gift Exchange game. This is a game where everyone is a winner! We had a lot of laughing and gift stealing, especially of the Star Pinata. It was shiny, pretty and fought over the most. Some prizes that people won after all the laughing and stealing of gifts, were: A Messier Objects book, Tickets to the AZ Science Center, shot glasses with "Shot into Space" images, DVD of "Universe," a book about asteroids, a "We are here" mat with an Earth globe, 2 tool boxes that could be used for eyepieces, a silver box for eyepieces, a red filtered flashlight, a camera mount, "Cosmos" on Blu-ray (the new Cosmos), a glow in the dark constellation calendar, and a few others. The 13 participants of this game were: William, Vera, Terri, Sam, Mike, Kevin, Howard, Frank, Ed, Bruce, Bette, Al and Alex. The rest of the attendees were laughing their heads off and taking photos.

The night was winding down, and now it was time to award the prizes. Many thanks to those who provided door prizes: Ed provided 4 door prizes, Terri provided 3, Kevin provided 4 originally and then later on, a 5th, and Paul brought 2. A door prize does not have to have anything to do with astronomy, but it does need to be wrapped. Here are the results and the prizes

awarded.

The dart game had these results: Taking 3rd place with a tie, were Ed and Kevin with a score of 5. Tied for 2nd place we had Frank, Ora and Pete with a score of 6. Bruce Wurst took 1st place with a score of 9. He was awarded the 2015 Dart Game Trophy, this year provided by PAS

and from the door prizes on the table, Bruce chose a heat-sensitive mug of the constellations and a Moon stress ball, provided by Kevin because there were only 4 members on one of his Trivia Teams.

The results Sam's Bean Bag Toss were: 3rd place - Cindy with 36 points - her prize from the door prizes was a multi colored pen with stars on it. Frank took 2nd place with 40 points and chose a book about finding objects called stars, and Andi took 1st place with 42 points - her prize was a Pleiades tee-shirt. Sam provided 1st and 2nd place prizes and Terri provided 3rd place.

Then the Trivia Game awards were given. Most of them were provided by Kevin (many thanks to Kevin for the planning and execution of the game and for providing such awesome prizes)! 3rd place was taken by Team Alex (Pete, Alex, Howard, Al and Ed) and they were awarded bags of chocolate candy. 2nd place was Team Sam (William, Rodney, Sam, Cindy and Andi) and they were awarded larger bags of chocolate candy (Ghirardelli). 1st place goes to Team Mike (Mike, Don, Terri and Frank) - they were awarded a heat-sensitive mug of the constellations and a Moon stress ball.

Then we did the prizes for the Dry T-shirt contest, hosted by Alex. We awarded the main prize first, provided by Alex



Kevin Witts doing Bean Bag Toss. In background (L to R) Eric, Ora, Kevin Harcey, Earl & Anita on Mike's Couch. Photo by Don.



Sam & Vera work together to run the Bean Bag Toss game. Photo provided by Cindy Smith.



PAS Annual Dart Game hosted by President Bruce Wurst. (L to R) Don, Howard, Kevin, Mike, Bruce, Alex & Ed. Photo by Terri Finch.

and won by Sam with his T-shirt that fit the category of "Astronomy and Science." Sam was awarded a Red Flashlight with 6 votes. Then we awarded the "Funniest Tshirt" which went to Kevin with 4 votes. The prize was a book on mythology. For the

PAS Social 2015 Jan 31

category of "Most Geek-ish" the award went to Alex with 3 votes - a prize from the door prize table. We had a tie for three people for the category of "Best Graphics," each with 2 votes: Terri won a Solar System mug provided by Kevin, Howard won a 2 sided puzzle provided by Terri, and Alex won a deck of astronomy playing cards.

At this point, there were several door prizes left on the table, so we awarded those using the red door-prize tickets. Ed, Alex, Bette, Terri, Eric and Vera were the winners of the remaining door prizes on the table. Many thanks to everyone who contributed door prizes so that we had enough prizes to award for the activities we did this year. And many thanks to everyone who participated in the activities. It was a wonderful night, it went smoothly and I really appreciate all the help in making this event a success. The last of the door prizes was given out about 11:25pm. That's when the event ended and everyone started heading home for the night.

Note for next year, we will begin earlier in the evening, maybe doing dinner at 4pm, to allow for all the games and activities so we don't stay up too late, not that astronomers aren't known for staying up late ;). And Mike, many thanks for hosting this fun even at your home this year!

Sam writes: This year we tried a new activity, a bean bag toss game. Over 20 people entered and 1st place went to Andie with 42 points, 2nd place to Frank with 40 points and 3rd place to Cindy with 36 points. There were loud cheers when someone would toss a bag through the hole, for 3 points. There were several occasions when a person hit a bean bag close to the hole and both bags went into the hole at once (6 points), even louder cheers. It was a fun game that anyone could play. Mike said he appreciated the fact that the bean bags being tossed in his living room were soft. He admitted that his heart skipped a beat a few years ago when we had a golfing contest in his living room with a real golf club and real golf ball. On the final round, Earl threw all four bean bags at once and 3 went through the hole for 9 points. That amazed everyone and got the biggest cheers of the night.

Cindy writes: Hi Terri, We had a wonderful time and hated to leave AZ but.... My only negative would be how late it lasted. But we still really enjoyed ourselves! I'll

send a couple pics that I took but only used my phone. Quality is not the best.

Terri adds: Thanks to everyone who provided photos from this event!§



Alex Vrenios wins the Category of "Geekiest T-shirt" in the Dry T-shirt Contest at the PAS Social. Photo by Terri.



Friends in the Hallway (L to R): Sam, Terri, William, Vera & Ora. Photo by Don Boyd.



Friends in the Kitchen (L to R): Howard, Bob, Eric, Al. Photo by Don.



Bruce Wurst wins this trophy, provided by PAS, for 1st Place Darts with a score of 9. There were 3 people who came in 2nd place (no award was given), tying with 6 points each. Read the review to find out who. Photo by Terri.



Sam Insana wins the Main Prize for the Dry T-shirt Contest in the category of "Appropriate for this event's Theme of Science / Astronomy." Photo by Terri.

Playing the Space / Astronomy Trivia Game provided by and run by Kevin Witts. Team Alex is in the background, & Team Sam is in the foreground of this photo. Photo by Don.



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Team Alex for the PAS Astronomy / Science Trivia Game hosted by Kevin Witts. (L to R) Ed Wurst, Al Smith, Pete Turner, Alex Vrenios & Howard Moneta. Photo by Terri.



Dry T-shirt Contest. We had 10 Contestants seen here (L to R): Sam, Vera, Alex, Pete, William (behind Terri), Terri, Mike, Frank, Howard, & Kevin.



Setting up for the White Dwarf Gift Exchange. The gifts are on the table, the circle of chairs has been made, we are all set to enjoy laughing our heads off!



Frank steals a gift from Alex. It happens to be the shape of a shiny Star and was the most stolen gift of the night. Photo by Don.



Vera steals the star from William, and the stealing frenzy continues with everyone laughing so very hard.



Sam decides not to steal the Star but instead to steal the package that looked like a telescope from Frank. Photo by Don.



After everyone in the circle has a gift in front of them, the opening begins. Alex opens his gift while Sam notices what his package says and share with the group. We all get a laugh. Photo by Don.



Vera & Frank find a globe of the Earth in the Telescope Box. Photo by Don

PAS Social 2015 Jan 31



Kevin Witts wins in the Category of "Funniest T-shirt" at the PAS Social Dry T-shirt Contest of Jan 31. Photo by Terri.



There were three winners tied with 2 votes each, in the Dry T-shirt Contest at the 2015 PAS Social. This is Howard Moneta. The Category was "Best Graphics." Other winners were Alex Vrenios & Terri Finch. This photo is taken by Terri.



White Dwarf Gift Exchange at the 2015 PAS Social at Mike's home in Carefree. Many fine gifts were received. Photo by Alex Vrenios



The heavyweight champion of the Cosmos

As crazy as it once seemed, we once assumed that the Earth was the largest thing in all the universe. 2,500 years ago, the Greek philosopher Anaxagoras was ridiculed for suggesting that the Sun might be even larger than the Peloponnesus peninsula, about 16% of modern-day Greece. Today, we know that planets are dwarfed by stars, which themselves are bound together by the billions or even trillions into galaxies.

But gravitationally bound structures extend far beyond galaxies, which themselves can bind together into massive clusters across the cosmos. While dark energy may be driving most galaxy clusters apart from one another, preventing our local group from falling into the Virgo Cluster, for example, on occasion, huge galaxy clusters can merge, forming the largest gravitationally bound structures in the universe.

Take the "El Gordo" galaxy cluster, catalogued as ACT-CL J0102-4915. It's the largest known galaxy cluster in the distant

universe. A galaxy like the Milky Way might contain a few hundred billion stars and up to just over a trillion (10^{12}) solar masses worth of matter, the El Gordo cluster has an estimated mass of 3×10^{15} solar masses, or 3,000 times as much as our own galaxy! The way we've figured this out is fascinating. By seeing how the shapes of background galaxies are distorted into more elliptical-than-average shapes along a particular set of axes, we can reconstruct how much mass is present in the cluster: a phenomenon known as weak gravitational lensing.

That reconstruction is shown in blue, but doesn't match up with where the X-rays are, which are shown in pink! This is because, when galaxy clusters collide, the neutral gas inside heats up to emit X-rays, but the individual galaxies (mostly) and dark matter (completely) pass through one another, resulting in a displacement of the cluster's mass from its center. This has been

observed before in objects like the Bullet Cluster, but El Gordo is much younger and farther away. At 10 billion light-years distant, the light reaching us now was emitted more than 7 billion years ago, when the universe was less than half its present age.

It's a good thing, too, because about 6 billion years ago, the universe began accelerating, meaning that El Gordo just might be the largest cosmic heavyweight of all. There's still more universe left to explore, but for right now, this is the heavyweight champion of the distant universe!

Learn more about "El Gordo" here: <http://www.nasa.gov/press/2014/april/nasa-hubble-team-finds-monster-el-gordo-galaxy-cluster-bigger-than-thought/>

El Gordo is certainly huge, but what about really tiny galaxies? Kids can learn about satellite galaxies at NASA's Space Place <http://spaceplace.nasa.gov/satellitegalaxies/>.

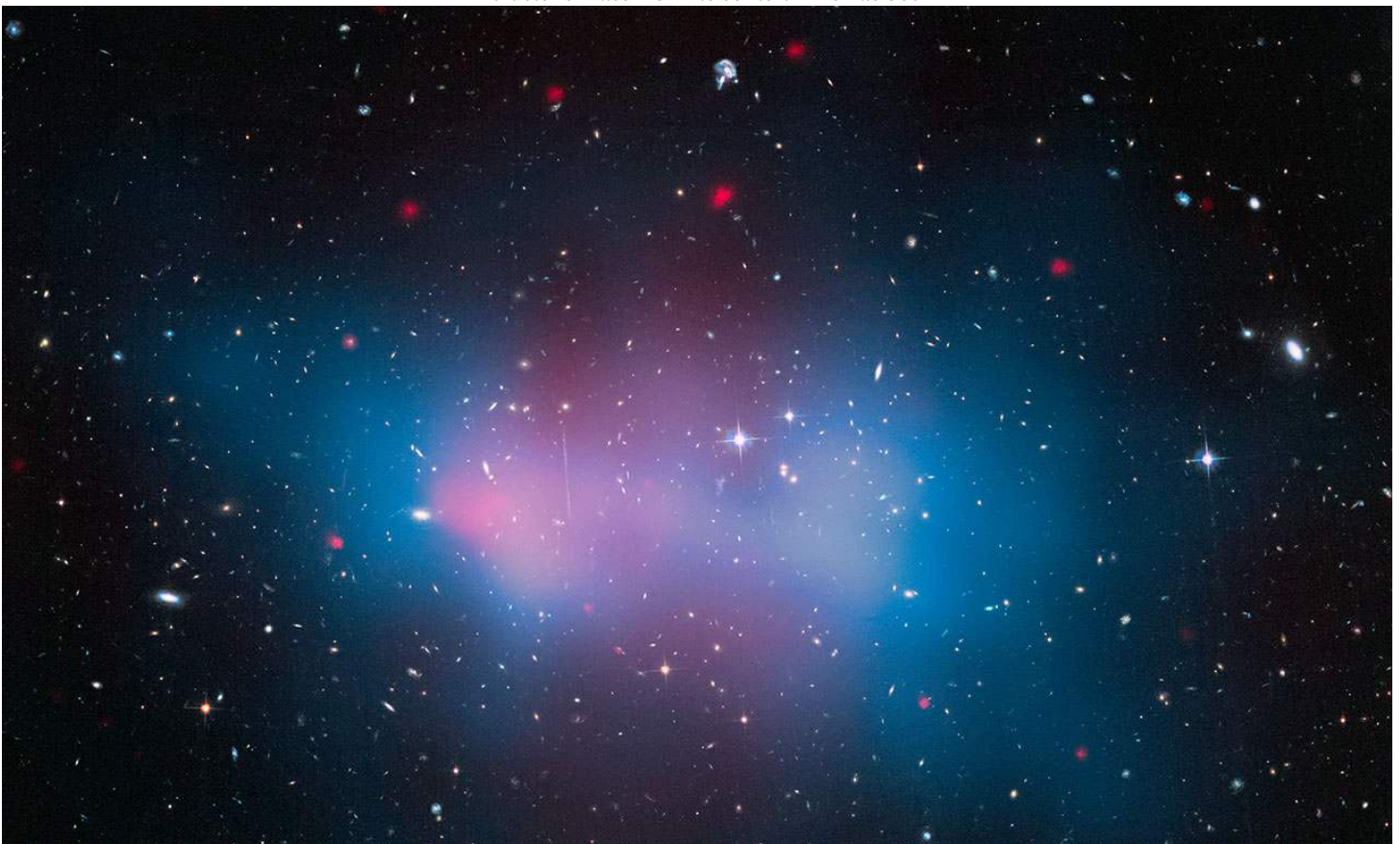


Image credit: NASA, ESA, J. Jee (UC Davis), J. Hughes (Rutgers U.), F. Menanteau (Rutgers U. and UIUC), C. Sifon (Leiden Observatory), R. Mandelbaum (Carnegie Mellon U.), L. Barrientos (Universidad Catolica de Chile), and K. Ng (UC Davis). X-rays are shown in pink from Chandra; the overall matter density is shown in blue, from lensing derived from the Hubble space telescope. 10 billion light-years distant, El Gordo is the most massive galaxy cluster ever found.

Antennas Dec 23

By Eric Steinberg

Howard Moneta, Kevin Witts and I met at the site in the late afternoon, joining Bob Christ and Don from SAC. Temperature was around 70 with a slight breeze under a crystal blue sky with no sign of cloud from horizon to horizon. We set up in a leisurely way, enjoying the balmy air, pausing to watch the flaming western horizon after sunset. Venus, suspended over the western ridges, gleamed like a tiny yellow sun. After dinner and some talk time, we aligned and began to observe. The night was close to perfect, though initially quite windy. Once the wind settled down, conditions were 10 for transparency and about 6-7 for seeing, improving gradually through the evening. With the Milky Way blazing overhead, I worked mostly on Herschel II objects, logging about 25 new ones. I also observed M15, M31/32/110, M33, M35, M37, M42 and M43. A high point of the night around midnight was the appearance (observed only by me I think) of Canopus above a gap in the ridge to the south. Canopus is the second brightest star in the sky after Sirius, but has a declination of around -52 degrees so we usually don't get to see it. It has a distinctly yellow-white color with the yellow strongly emphasized by its closeness to the horizon. I finished up around 12:30 and got some sleep. That wild-and-crazy Kevin slept outside under the stars – pretty neat to do, but way too cold for this reviewer who retreated to the “comfort” of his car. Overall, a great night.

Kevin writes: It was my first trip to the Antennas site and it was an amazing experience. After receiving an invitation and directions from both Eric and Howard, I headed to the site at about 3:00 pm. After an uneventful drive west, I arrived at the site at approximately 4:30 or so.. Antennas

is in an isolated area just off of I-10 on the way to Quartzsite and is basically a cleared area of desert isolated between some low hills. There are no amenities. It's a completely primitive area.

I planned to either sleep in the car, or ideally to sleep outside under a blanket of stars. I took along a fleece blanket, three sleeping bags, a pillow, chaise lounge chair, some food and warm clothing. When I arrived, Eric and Howard were already there and setting up. After some brief greetings, I unloaded the car and set up my scope.

We sat together and marveled at the beauty of the area while eating our dinners. The sunset was spectacular and we noticed that Venus had risen just under the quarter moon. Mars soon appeared after that. The Moon was rather amazing in that, not only did you see the sunlit part, there was a considerable amount of “earthshine” which slightly illuminated the rest of the disc; enough so that you could distinguish Mare, highlands and some features such as Tycho through a scope.

Once it got dark, the sky was incredible. Completely cloudless with a gorgeous Milky Way overhead. I was awestruck by it and couldn't stop commenting on it.

Throughout the course of the night, I was able to see EVERY item listed in my Go-To registry on the scope. Andromeda was fantastic and took up the entire eyepiece. I was also able to see features of M110, which I'd never seen in my scope before. I can't possibly list all of the items that I saw, as there were too many. The sky was dark and the spread across the heavens can't be described adequately. I observed for several hours through the very cold night and was able to also look in on some



Kevin's set up at Antenna's on Dec 23, 2014. Looks like a super clear night for viewing. Photo taken by and provided by Kevin Witts.

objects that Howard and Eric featured as well.

Around midnight or so, I settled down onto my “bed” which consisted of the lounge chair with a sleeping bag under me, my clothing and jackets, a fleece blanket and then two more sleeping bags as covers. I did as I planned, which was to sleep out under the stars that night. However, it was hard to get to sleep considering the amazing view. I was first-up and packed early and Howard graciously agreed to stay and ensure that he and Eric got off safely, so I headed back to Phoenix around 8:00 am or so. A magnificent night and one that I hope to replicate again soon.§

Live Astronomy Cams

By Mrs. Brooke Krueger

Bruce and Chris, Thanks for making your page with astronomy information - <http://www.pasaz.org/links.html>

As an assistant troop leader for my daughter's girl scouts, I'm keeping busy by helping put together guides for their patches. They're currently working on getting their earth science patches. Your page has been a big help with the astronomy information! We've referenced it quite a bit!

...I've never been good with science, so you get an extra thanks from me haha!

One of the girls found another good guide that's not listed on your site: <http://www.livewatch.com/watch-live-astronomy-cams-and-resources>

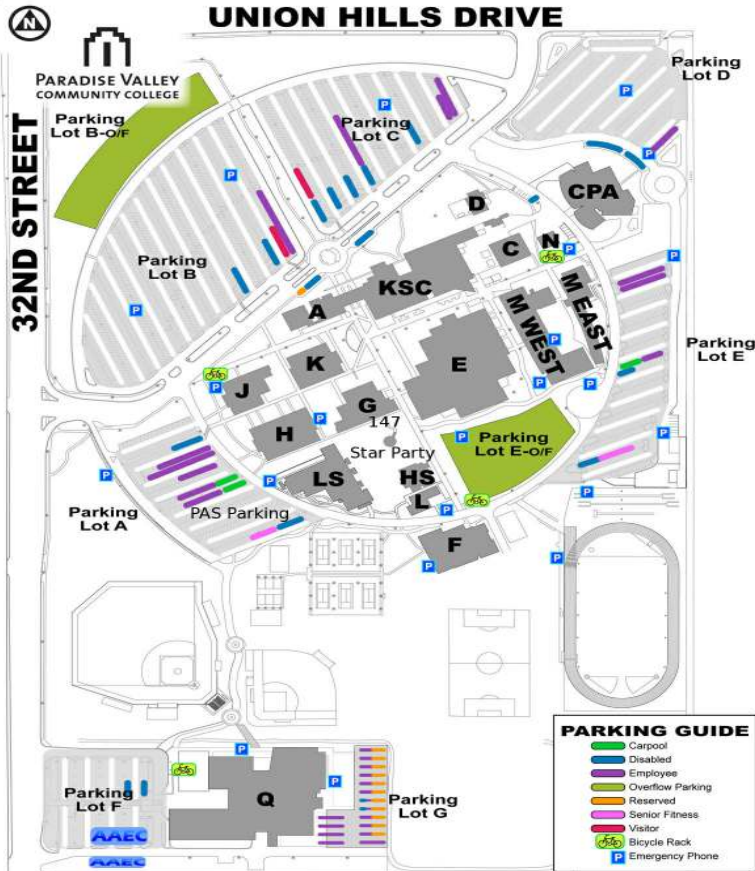
Everyone loved it - including me! The webcams are fantastic (wish they had those when I was a kid - I might have liked science more haha!) ...but there's also a ton

of educational resources to check out - we all loved the phases of the moon!

I know you're probably busy, but could you take a minute to include a link to this guide on your page? If there is anything that I've learned in my years of working and raising kids, it's that encouragement is such a powerful thing! I'd love to show the troop they're on the right track! I'll be meeting with them tomorrow! Best! ~ Brooke§

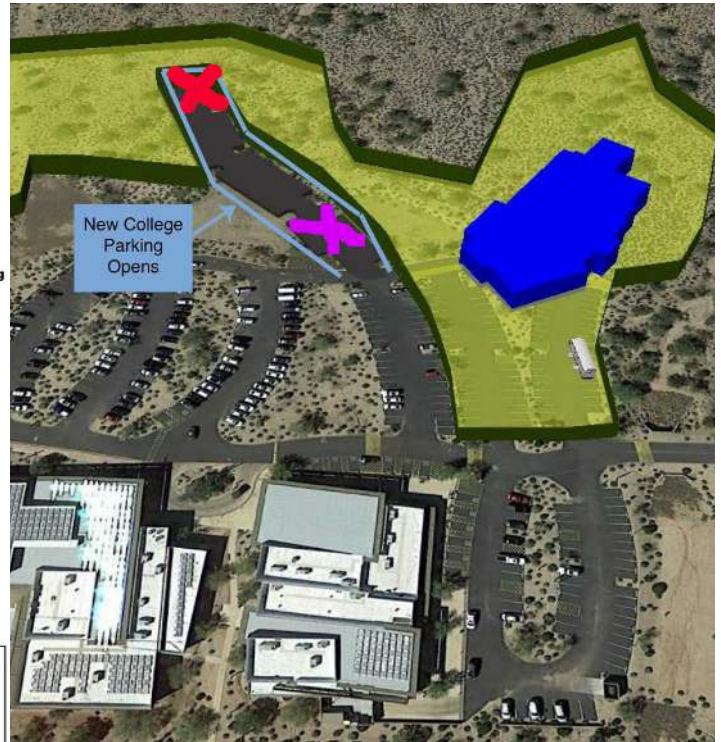
Map of PVCC Main Location

18401 N. 32nd Street | Phoenix, AZ 85032



Black Mountain Campus of PVCC

34250 North 60th Street, Scottsdale, AZ 85266



The Red X is Scope set up. The Purple X is PAS Parking.

April 2015

Sun	Mon	Tue	Wed	Thu	Fri	Sat
			1	2 PAS Meeting LS-205	3	4
5	6	7	8 CTCA (Private)	9 Apr 9 Awards Ceremony (Private)	10 School Star Party (Private)	11
12 Telescope Workshop	13	14	15	16 Public Star Party at BMC	17 Private Star Party	18
19	20	21	22 CTCA Back Up (Private)	23	24 School Star Party (Private)	25
26	27	28	29	30		

Don Boyd
PAStimes Editor
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To:

2015 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.

Here's the scheduled Guest Speakers at PAS:

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

May 7: Earl DeLong "Our Journey to Pluto: Nasa's New Horizons Mission"

----- Summer Break -----

Sep 6: Members & Guests Night: Sign up with Terri to do a mini presentation.

Oct 1: Rik Hill "The Latest with CSS and Near Earth Asteroid Surveying"

Follow PAS on:

Twitter - <https://twitter.com/PASevents>

Facebook - <https://www.facebook.com/PhoenixAstronomicalSociety>

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

What's Up For April?

By Rod Sutter, PAS Past President

Planets

Name	Date	Rise	Set
Mercury	04-15-15	06:17	17:26
Venus	04-15-15	07:57	22:09
Mars	04-15-15	06:45	20:11
Jupiter	04-15-15	13:03	02:49
Saturn	04-15-15	21:51	08:15
Uranus	04-15-15	05:39	18:15
Neptune	04-15-15	03:59	15:15
Pluto	04-15-15	00:56	11:07

All Times Arizona Time

April 15 2015

Sunrise: 05:58

Sunset: 18:59

Full: April 4

Q3: April 11

New: April 18

Q1: April 25



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