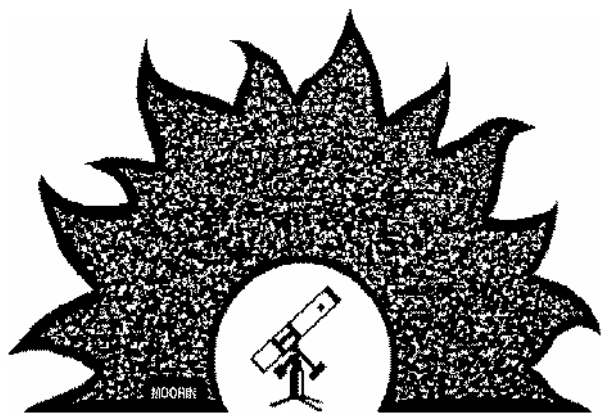




PAStimes

Phoenix Astronomical Society

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PHOENIX ASTRONOMICAL SOCIETY — ESTABLISHED 1948

Light Pollution: Where we are in 2016 Dan Heim to Speak at May 5 Meeting

By Dan Heim

"The battle against light pollution never ends. Electronic billboards still constitute a major threat. The recent defeat of HB 2507 (which would have permitted expanded use of electronic billboards) was a victory for Arizona astronomers, but it's sure to rear its head again in the next legislative session. In this presentation, you'll learn more about the current state of light pollution and how you can help."

At the May PAS Meeting we hold the PAS officer elections. Come cheer on your

chosen elected PAS Officer. It's a party so bring a snack to share. Bottled water will be provided by the PAS Snack Fund, please donate a little to keep the bottled water coming to the meetings.

This is the last meeting of this PAS season. Let's make it the best one! Shortly after the Officer Elections, Dan will take the floor. Dan always provides a super informative, educational and fun presentation. You won't want to miss this one. See you there!



Dan Heim, Guest Speaker for the May 5 PAS Meeting. Photo provided to PAS by Dan Heim.

PAS Meeting Apr 7

By President Sam Insana

The April 7th PAS general meeting had 22 in attendance, although several regular members were absent due to illnesses.

Past members Bruce and Sherry Myers (who brought delicious chocolate treats) attended because they knew our speaker Elliott Rachlin. Elliott gave a fine lecture on a telescope mount he designed and patented for the International Space Station. The months of work he put into the project were condensed into a one hour presentation. The advantage of a telescope on the ISS is that it could have continual maintenance at low cost, instead of requiring special trips at great expense as with a telescope like the Hubble. The problems however, are the ISS structures interfering at times with the direction of viewing. Even so, Hubble, like the ISS would also have interference by the Moon and the Earth at times.

The person Elliott has known the lon-

gest is Eric Steinberg, since he was 1 1/2 years old. Unfortunately Eric, who helped get Elliott to speak for us, was too ill to attend.

After the talk, the Telescope Favorite Objects project was announced by Sam Insana as completed; it will be handed out at telescope workshops and be available in the future on our PAS website. He thanked Leah, Eric, Howard, Mark, and Peter for helping him with the project. Many upcoming PAS events in April and early May were then announced.

During the meeting Sam, President of PAS, invited members to tell astronomy jokes. As can be seen by the one he told on Thursday night, they don't have to be great: "A Higgs Boson tried to walk into a church but the priest told him he couldn't come in. The particle responded that without him there would be no mass."

A lively discussion about the proposed

new point system for Star Tour events was then chaired by Christine. There were differing opinions, but it was suggested that we try the new system in place of the old rotational system, for the next year and see how it works. It could always be adjusted in the future.

Sam would also like to thank everyone who brought the delicious snacks and treats to the meeting.



Elliott Rachlin, taken by Don Boyd at the April 7 PAS Meeting.

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May and June Upcoming Events

By Terri, Event Manager

Check out these and other events on the PAS Calendar:

<http://www.pasaz.org/forums/calendar.php>

All outdoor events are weather permitting and RSVP is highly suggested, and sometimes required if seating or parking is limited. RSVP Events@pasaz.org to attend.

May 3: School Event in Goodyear (Private)

May 5: PAS Meeting at PVCC in Room LS 204. Come enjoy a wonderful presentation by Dan Heim. Bring a snack to share. Bottled water provided by PAS snack fund. Everyone welcome. Doors open 7pm. Meeting begins 7:30pm.

May 7: School Event in Peoria (Private)

May 9: Mercury Transit at both PVCC Campuses from 7:30am to 11:30am. Bring your whole family! PVCC Main Campus is 32nd Street and Union Hills Rd. PVCC Black Mountain Campus is at 60th Street and Carefree Hwy. Please RSVP with number in your party.

May 11: Star Party in Goodyear (Private)

May 12: Huge public star party at PVCC Black Mountain Campus, 60th Street and Carefree Hwy from 7pm to 10pm. Set up is 6pm for telescopes. Everyone welcome. RSVP is requested with Terri Events@pasaz.org. This event is weather permitting. When you RSVP by email, please include the number in your party. We usually provide 10-14 scopes for your viewing pleasure. We ask that you do not touch the telescopes. Please RSVP with number in your party.

May 13: School Event in Scottsdale (Private)

May 14: International Astronomy Day. Bring the whole family to Roadrunner park at 40th Street and Cactus Rd in Phoenix from 7:30 to 10pm. Huge public star party for everyone to enjoy. We ask that you please do not touch the telescopes. Please RSVP with number in your party.

May 15: Free telescope workshop at Bookmans, 19th Ave and Northern in Phoenix - 3:30pm to 5:30pm. RSVP is required with Terri Events@pasaz.org. When you RSVP, email the make and model of the telescope you need assistance with. We also assist with suggestions and advice on what telescope to purchase to match your needs. We have no telescopes for sale at this event. RSVP is required as seating is limited.

May 16: Back up date for school event on May 13.

May 26: Back up date for private event on May 11.

May 28: Huge star party in Carefree to observe Mars, Jupiter and Saturn. It's a "Mars Party". Potluck is at 5:30 and event is from 7:30 to 11:30pm. RSVP is required so we can send you directions to location and because parking is limited. RSVP early. When you RSVP, please include the number in your party. Bring as many friends and family members as you can stuff into your car. If you are not attending the potluck, please inform me, in your RSVP, what time you expect to arrive, and please arrive before dark. Sunset is 7:30pm, so you must arrive by 8pm to attend.

June 3&4: PAS will be at Comicon outside doing an evening star party from 8pm to 10pm or later.

June 3: Star Party in Phoenix (Private).

June 4: Star Party in North Phoenix (Private)

June 9: Star Party in North Phoenix (Private)

June 11: FREE Sidewalk Astronomy Event at Bookmans - Public Stargazing. Come to Bookmans Entertainment Exchange at 8034 N. 19th Ave. Phoenix, AZ 85021. PAS will have telescopes set up from 7pm to 10pm for your viewing enjoyment of Jupiter (visible 7:25 pm) and the Moon (visible 9:00 pm), possibly along with some other bright evening objects. This is a free event, open to the public. PAS will have an information table set up outside. Kids can do Q&A with Terri and win a prize for answering questions. RSVP is requested with Terri Events@pasaz.org - in case the weather (high winds, rain, or clouds) cancels this event. We ask that you do not touch the telescopes.

June 18: PAS field trip to Mount Graham in Safford (Private - PAS Members only)

June 19: Free telescope workshop at Bookmans, 19th Ave and Northern in Phoenix - 3:30pm to 5:30pm. RSVP is required with Terri Events@pasaz.org. When you RSVP, email the make and model of the telescope you need assistance with. We also assist with suggestions and advice on what telescope to purchase to match your needs. We have no telescopes for sale at this event.

June 23, 24, 25 and 26: PAS will be at Leprecon! June 23, 24, and 25 PAS will have telescopes set up those evenings from 7pm to 10pm outside on the deck. June 24, 25, 26, PAS will be indoors with a table of info, and Q&A for the Kids to win prizes from 10am to 7pm.

PRESIDENT'S CORNER: UPCOMING ELECTION

Sam Insana, President of PAS

I encourage all PAS members to vote in the upcoming elections on May 5th. I ran for President last year asking for no more than two years to accomplish certain goals. So far in my first year as President, with the help of many PAS members, we have been able to (1) **update the PAS website** on "People of PAS", "Upcoming Events" and "Education" (which Terri and Don should be finishing up shortly). (2) **Do citizen science projects in astronomy**, we have done meteor studies for the Perseids and Gemini showers and had them published on internet with the International Meteor Organization. We also now have the opportunity to do occultation studies thanks to member Ted Blank. Alex, Ted, and Bob will be trying to calculate the distance to the sun during the Mercury transit May 9th (3) **Do dark sky studies** so that members would know where to star gaze in the Valley, on the outskirts and far away. Those results were published in the February 2016 PAS newsletter at page 4. (4) **Bylaws updating**: with the help of our PAS Board of Directors and the PAS members voting, we accomplished that and the updates are now online. (5) PAS didn't do an event for astronomy day last year so I wanted to correct that. This year on **International Astronomy Day** May 14 we are showing the Moon, Mars, Jupiter and Saturn in a park for the public. (6) **Do field trips to Observatories and Planetariums**. We have been able to take a fun trip in November to Kitt Peak and the Flandrau Planetarium in Tucson and will be going to Mt Graham to see the

Binocular and Vatican observatories in June. (7) Since our club has doubled in size and events over the last few years I **suggested that officers and the Event Manager delegate some work to other members** to help out. Terri has had help from several members. I have had help from Kevin, Howard, Jenny, Paul, Rodney, Eric, Alex, Don, Terri, Peter, Leah, Mark, Christine, Earl, Rick, Mike, Ted, William, Bruce, Chris, Storm, Vera, Frank and several other members. (8) My monthly **President's Corner article for the PAS newsletter** can help give information and guidance to our members and the public, and so far I have had positive feedback from those who have read the articles. (9) A **telescopic objects list of favorites to be seen with various sized scopes**. This has been accomplished with the help of Eric, Mark, Peter, Leah, Howard and Sam. I have handed out the finished document to a new member who wants to know what he can see if he buys a telescope. I would like it on our website, and hand it out at telescope workshops. It can be updated if more members want to contribute information.

Although much has been accomplished there are more goals if I am President one final year. (1) A **binocular star party** for PAS members and the Public at Mike's much like the fun event put on by the Kitt Peak astronomer at Saguaro National Park in November. (2) **More citizen science projects like spectroscopy, variable star studies, sunspot and solar flare studies**. (3) **PAS tee shirts or polo shirts**

for the membership. (4) Encourage **astro-photography** and have monthly exhibits of the photos either on line or at the meetings or on our website. (5) A **member carpooling system** since the valley is over 1000 square miles. (6) **Give Terri more help** in her tasks.

(7) A **binocular objects list** from our members to other members and the public.

(8) A **field trip to ASU astronomy and meteorite museums and planetarium**.

As President I have also found 8 speakers for our monthly meetings, facilitated the monthly general meetings and meetings of the minds, helped as liaison with many school star parties, worked with Jenny on our meeting, observing sites and special events at PVCC and Black Mountain, replied to numerous public and member inquiries sent to me by email, phone calls, texts, and snail mail, tried to smooth out a few disagreements among PAS members and helped research and write a letter of recommendation for David William for a Carl Sagan Medal nomination.

Even if I am not elected President for one more year I plan to continue to be active and help with telescope workshops and star parties, attend socials, the music jam, meetings, do weather analyses and research and speak on the upcoming total solar eclipse with Alex. It has been a busy and fun year and I thank all the PAS members, officers, Board of Directors, and our Event Manager for all

PAS Officer Elections May 2016

Collected by Terri Finch, Event Manager

This is a compilation of the current officers of PAS and their thoughts on running for office for another year or giving the position to someone new. I also included those who would like to be considered for an officer position in PAS for this next year. Thank you all for your shared thoughts.

Don Boyd, PAS Newsletter Editor would like to retain his position as Editor. **Don** writes: "I want to run again."

Kevin Witts, PAS Secretary (a new position as of 2016) writes: "I would like to remain as secretary."

Sam Insana, President of PAS writes: "I would like a second year as President and that will be it." Please see Sam's President Corner article in this issue.

Eric Steinberg, PAS Treasurer writes: "I would like to continue as Treasurer."

Howard Moneta, PAS Vice President writes: "I do not plan to run again as Vice President for the upcoming year. My enjoyment comes from the good friends that I have made at PAS as well as exploration, discovery, and learning about science. Most of all I want to spend time out under the night sky. I love teaching others through telescope workshops, night sky training sessions, star parties, etc. My heart isn't in it for the business side of the club.

Definitely, I encourage people to run for VP. There are a lot of opportunities to contribute to the club's growth and expand our outreach in positive ways."

Terri Finch (that's me), Event Manager

er writes: "I have been Event Manager for a long time. Sometimes this position is very time consuming, but mostly it is a labor of love. I shall keep my position as Event Manager for another year."

Alex Vrenios, Member at Large, writes: "I would like to be considered as PAS Vice President. I attend all of the meetings and the telescope workshops. I've done presentations for club members and written several articles for the PAS newsletter. I've also worked alongside others on some special projects, like updates to the PAS By Laws, planning for the upcoming solar eclipse and supporting the meteor count reporting process."

Kevin Witts writes: "I think Alex would be excellent in this role."

Some Big Events Coming Your Way!!!

May 9, May 14, June 2-5, June 23-26

PAS will be at Lepre-con this year! June 23, 24, 25, 26 PAS will have a table indoors on June 24, 25, 26 from 10am to 7pm, and a table and telescopes set up outdoors from 7pm to 10pm for your viewing pleasure. Highlights of the viewing will be Saturn, Jupiter, the Moon, Mars and more. We hope for a huge public turnout and better, less windy weather than last year's event. Hope to see you there! More details about Lepre-con can be found at leprecoon.org.

PAS will be at Comi-con this year! Phoenix Comicon is June 2-5. PAS is doing telescopes in the evenings from 7pm to 10pm on Friday and Saturday nights (maybe Thursday - check the PAS Calendar to confirm this date). This is outdoors on the

Patio at the South Building of the Phoenix Convention Center at Washington and Jefferson, on the East side of 3rd Street. Come see Jupiter, Mars, Saturn and more! More details can be found at this link: www.phoenixcomicon.com

PAS is hosting a Public Star Party at RoadRunner Park in Phoenix on May 14 for International Astronomy Day. We will be viewing the Moon, Jupiter, Mars, Saturn and more from 7pm to 10pm. This is a free event open to the public. Bring everyone you know and come enjoy a peek through our high-powered telescopes. More details can be found at this link: <http://www.pasaz.org/forums/calendar.php?do=getinfo&e=1922&day=2016-5-14&c=1>

Mercury Transit May 9 at PVCC. PAS will be hosting a viewing of a rare event on May 9th at both PVCC Campuses from 7:30am to 12:30pm. This is a free event and open to the public. Bring everyone you know and come see Mercury move across the surface of the Sun, viewing through our safely filtered high-powered telescopes. PVCC Black Mountain Campus is at 60th Street and Carefree Hwy and the link to more info about this location is at: <http://www.pasaz.org/forums/calendar.php?do=getinfo&e=1969&day=2016-5-9&c=1> And PVCC Main Campus is at 32nd Street and Union Hills and the link to more info about this event is at:

<http://www.pasaz.org/forums/calendar.php?do=getinfo&e=1968&day=2016-5-9&c=1>

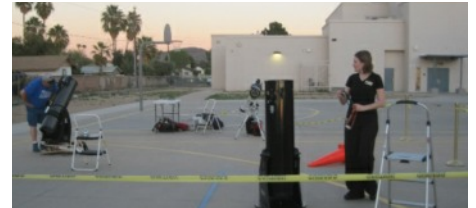
Cholla Middle School Star Party Feb 17

By Terri, Event Manager

This year the Cholla event saw some new attendees from PAS. William and Terri Finch attended with one scope and Q&A. Christine Mintzmyer brought her 10", Don Boyd had his 8", and Earl DeLong brought his 10". We had a nice crowd and great weather for this event. Paul Vachon, my contact at the school, had a few other nearby schools joining in also - it was a huge event.

Near the end of the event, Jupiter was due to rise in the East, and several of us,

using our phone apps, guessed where it would rise. To our surprise it was much more South of our predicted rising point. I just barely lined up on Jupiter, showed a few people, and made sure Paul saw it, before he asked us to pack up because the crowd had left. We had a delicious pizza and salad dinner. Many thanks to Paul for having us at his event this year. We look forward to many more fun observing sessions at Cholla! And thank you to my telescope team for all they do at these events.



Setting up for this awesome Star Party at Cholla Middle School. We see in this photo: Earl DeLong looking through his scope, Don Boyd's scope in the background (on white tripod), Christine Mintzmyer and her scope on the right. Out of photo is Terri Finch's scope to the left and this photo is facing East. Photo by Terri

Telescope Workshop at PVCC Feb 18

By Terri, Event Manager

Although we had 2 RSVP's for this event, neither showed up, so, the attending PAS Members had an hour conversation about upcoming events at Mike's house and then called it a night.

Attending this event, and providing input for Mike's upcoming events were: George Sabo, Rodney Fong, Don Boyd, Mike Marron (probably a good thing Mike attended, since the conversation turned to events at his house), Sam Insana, William and Terri Finch, Alex Vrenios and Ofelia Waters. We look forward to a busier workshop in March.



At the Telescope Workshop, we used the time, since no Attendees showed up, to talk about upcoming events. In this photo (L to R): Rodney behind Ofelia, Mike leaning on the table and Alex behind him, Sam looking forward towards William. Photo by Don Boyd.



PVCC Telescope Workshop on Feb 18. We held the event but had no public show up for the class. However we had a great turnout of PAS Members: (L to R) Don Boyd, Ofelia Waters, Rodney Fong, George Sabo, Mike Marron studying his meteorite and William Finch, plus a few more. Photo by Terri Finch.

Many Thanks to All PAS Members

By Terri, Event Manager

I wish to thank the many PAS Members who make PAS an awesome Astronomy Club to belong to! In my below article, the word "current" means before the May 5, 2016 officer elections. These members and others I didn't mention, really make the club what it is today!

Mike Marron, who hosts many events at his historical home in Carefree, with potlucks, star parties, movie nights, and more. Mike is seen at almost every event PAS has with his Meteorite collection.. Mike is a fantastic friend to everyone!

Alex Vrenios who has provided many excellent presentations to PAS as well as reviews for the newsletter. Alex's wife Diane is awesome, too!

Sam Insana, our current President who really takes the events to heart and is there to help in any way he can. Sam is an amazing President and friend of the club. Vera and Frank (Sam's wife and son) are great to know too.

Bruce Wurst, current Past President, not only my brother but a wonderful friend to the club members. Bruce fixes telescopes, finds guest speakers, is seen at many events and provides snacks when they are needed.

Christine Mintzmyer is the newest "core" member of PAS. She has provided and designed (in discussion with me) the new Star Tours point system. She is also at many events and is a pleasant person to know. I hope to see a lot more of Christine at PAS events! I'd also like to mention Johnny, Christine's warm and caring husband.

Don Boyd, current PAS Editor of our newsletter. Don has been a real core member of the club for a very long time, as Editor, as well as attending many events, even when he was driving up from Chan-

del to attend. He is very reliable and great to know!

Kevin Witts is a reliable, very involved member of PAS. He is the current Secretary of the club, which is a newly created position as of last year. Kevin is always fun to be with!

Howard Moneta, current Vice President of PAS, is also very active with the club and is seen at many events. Knowledgeable and nice, I really appreciate Howard being part of the PAS.

Eric Steinberg is another member of PAS I really appreciate. Eric is super talented with music and has taken over as the current Treasurer of PAS and has computerized our books, a really huge task to accomplish! I love having Eric as club colleague. Ora Kurland is Eric's wife and a wonderful lady to know. She really makes the events that much brighter with her attendance.

Roger Anzini is a great PAS member to know. He brings his scope to many of our events and very actively does outreach throughout the week. He's a great person to have in the club.

Rick Cunningham Rick can't attend many of the events, but when he does, he provides good company and great views through his telescope.

Terry Dancer, who is very busy lately with his own business, is also another solid member to have in the club.

Earl DeLong is an interesting club member to know. He is well versed in engineering and has done several great presentations for the club.

Bob Ewing, who has moved to Portland, is a great guy to know. We hope he returns some day, but he is maintaining his membership in PAS. Bob is one of those

really awesome people who just beams with warmth when you meet him. Thanks, Bob, for all you have done.

Paul Facuna - when I first met Paul, it took a while to get to know him, but now that he and I have worked together for quite some time, I find that Paul is a terrific guy who is very interested in learning more about astronomy. Paul is very helpful at events and I really appreciate his involvement. Thank you Paul.

Now, that Rodney (Fong) guy... He's something else.... Rodney has become a great PAS member, is seen at many events and plays the part of Meeting Host. He is really helpful and a great conversationalist. I hope to see a lot of Rodney through the years I am involved with PAS.

Dewell Howell (and wife Wendy) - Dewell is a wonderful individual and a great person to have in the club. I met Dewell quite a while ago and he is just someone I really appreciate and enjoy knowing.

Leah Sapir, although not seen at many events due to family obligations, she is a wonderful asset to have in the club. Very caring, and helpful. Leah is our "Question Department" at PAS. She also provides a (mostly) monthly article for the newsletter - "AZ Skies."

Pete Turner is a great friend to the club. Pete is full of enthusiasm and is always looking to learn more about astronomy. I am so grateful to know and work with Pete.

This club offers so many interesting easy-to-talk-to members. I've mentioned the more active members of the club, in this thankyou article, but really, all of the PAS Members are fantastic to know. Thanks to all PAS Members who make this club so awesome! I really appreciate all of you!

For Sale

Binos for Sale: I have a like new pair of Miyauchi 100mm Flourite APO 45 binoculars I would like to sell. They come with carrying case, Miyauchi 3x12mm finder, 20x and 37x eyepieces. I also had a surveying instrument company fit a Hewlett Packard mount. This is more solid than the no longer available Miyauchi fork mount. I will include a heavy survey tripod, mount and a Trimble pier mount (for commercial GPS). A similar pair sold recently w/o mount on astromart.com for \$3500. I want \$3000 and will drive it (don't trust shipping) to any location in Arizona. I am in Gold Canyon if you wish to pick it up. Email: monte-crawford@hotmail.com.

Nexstar 9.25 carbon fiber; Fastar Compatible. Asking price is \$1,500 for the package which includes: Eyepieces: 4mm, 6mm, 9mm, 15mm, 32mm, 40mm, a 2x Barlow lens; Filters: No. 21 orange, No. 25 red, No. 12 yellow, No. 80a light blue, No. 58a dark green, No. 56 light green. Also included is a red clip on light. Please contact: Terry at Tmranger86@gmail.com or (602)-703-3772. All photos can be seen here: <https://www.dropbox.com/sh/l9ak53vbuwijupu/AABr2UwkkbaPxIRaJsEQyuMYa?dl=0> ***

Basis Mesa Star Party Feb 19

By Sam Insana President of PAS

PAS attended the Basis Mesa science night event along with about 1000 students, parents and teachers. Inside the school, there were dozens of activities. Mike Maron again delighted people with his meteorites, with Ophelia Waters assisting him. Pete Turner, Don Boyd and I showed Jupiter, Gamma Andromeda double star, ET cluster, Pleiades open cluster, Orion Nebula, and the Moon with our telescopes. Members of ASU, East Valley, and the new Superstition Astronomy clubs were also in attendance with about 15 telescopes in all. I especially enjoyed meeting Superstition Astronomy member Joe Gerencher who had a homemade spectrograph attached to his refracting telescope. He showed us the beautiful light spectrum of Sirius and Betelgeuse, highlighting their very different spectra.

Jon writes: Terri, Your team was amazing on Friday night! The combination of Mike and the scopes made our event wonderful. Everyone is so professional and they did a fantastic job with our students and guests. I am already starting to think of the next event. I'm extremely pleased with how well this event went. Here's some pictures of our event last Friday. http://www.pbases.com/wjshaheen/basis_mesa_school_science_night_19feb2016



The Basis Mesa scope line up. Photo provided by Sam Insana.



(R to L) Pete Turner, Don Boyd and Joe of Superstition Astronomy Club at Basis Mesa. Taken by Sam Insana.



Mike at Basis Mesa School on Feb 19. Photo by Sam Insana.

Arroyo School Mar 2

By President Sam Insana

PAS put on a star party for the Arroyo school in Glendale. Earl DeLong, Roger Anzini, Christine Mintzmyer, Don Boyd, and I provided telescopes. We showed Jupiter, Orion Nebula, 2 different double stars, 2 different open star clusters and a few other objects. Kevin Witts had his globes of Venus, Mercury, Mars and the Moon to educate and entertain. Between 100 and 200 people - students K-8, parents, teachers, security and custodians - enjoyed looking through our telescopes. We actually had less than 90 minutes of dark skies, but the Principal and various teachers said they want us back again and hope to schedule a longer viewing.



Sam, Earl & Roger are chatting prior to the start of the event. Looks like a great night for a star party at Arroyo School. Photo by Don.



Christine & Kevin are seen setting up for this event. Photo by Don Boyd.

Scope for Sale

Like new! Questar 3.5" Standard telescope with Pyrex mirror, broadband and low reflection coatings. Model #10214. \$3,850.00
Contact seller at: cancourt77@gmail.com More details about this scope can be seen at this link: <https://www.dropbox.com/s/0d7s3c72vhk71st/Scope%20for%20Sale%20Questar%2010214.pdf?dl=0>



Hubble Shatters The Cosmic Record For Most Distant Galaxy

By Ethan Siegel

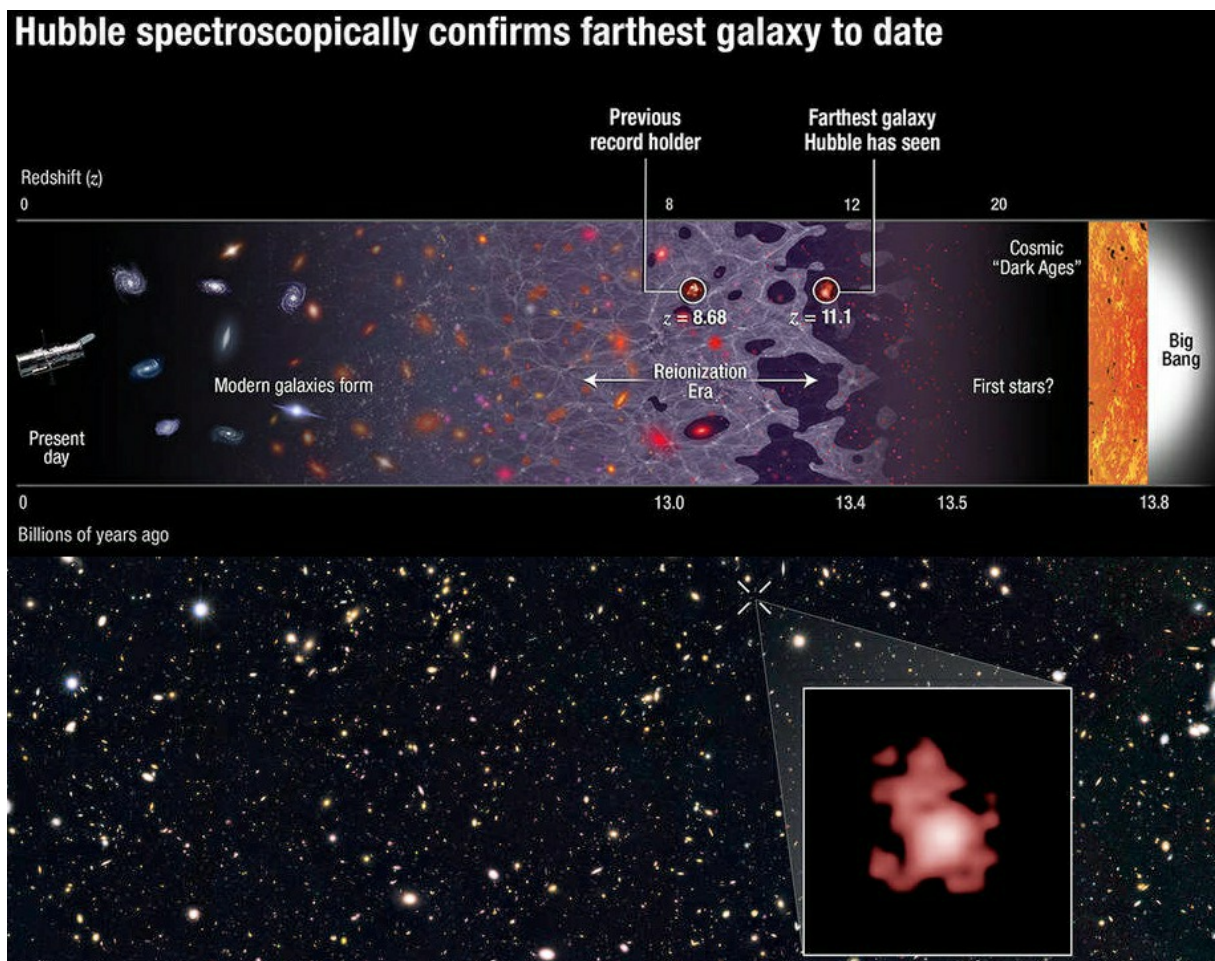
The farther away you look in the distant universe, the harder it is to see what's out there. This isn't simply because more distant objects appear fainter, although that's true. It isn't because the universe is expanding, and so the light has farther to go before it reaches you, although that's true, too. The reality is that if you built the largest optical telescope you could imagine -- even one that was the size of an entire planet -- you still wouldn't see the new cosmic record-holder that Hubble just discovered: galaxy GN-z11, whose light traveled for 13.4 billion years, or 97% the age of the universe, before finally reaching our eyes.

There were two special coincidences that had to line up for Hubble to find this: one was a remarkable technical achievement, while the other was pure luck. By extending Hubble's vision away from the

ultraviolet and optical and into the infrared, past 800 nanometers all the way out to 1.6 microns, Hubble became sensitive to light that was severely stretched and redshifted by the expansion of the universe. The most energetic light that hot, young, newly forming stars produce is the Lyman α line, which is produced at an ultraviolet wave-length of just 121.567 nanometers. But at high redshifts, that line passed not just into the visible but all the way through to the infrared, and for the newly discovered galaxy, GN-z11, its whopping redshift of **11.1** pushed that line all the way out to 1471 nanometers, more than double the limit of visible light!

Hubble itself did the follow-up spectroscopic observations to confirm the existence of this galaxy, but it also got lucky: the only reason this light was visible is because the region of space between this

galaxy and our eyes is mostly ionized, which *isn't true* of most locations in the universe at this early time! A redshift of 11.1 corresponds to just 400 million years after the Big Bang, and the hot radiation from young stars doesn't ionize the majority of the universe until 550 million years have passed. In most directions, this galaxy would be invisible, as the neutral gas would block this light, the same way the light from the center of our galaxy is blocked by the dust lanes in the galactic plane. To see farther back, to the universe's first true galaxies, it will take the James Webb Space Telescope. Webb's infrared eyes are much less sensitive to the light-extinction caused by neutral gas than instruments like Hubble. Webb may reach back to a redshift of 15 or even 20 or more, and discover the true answer to one of the universe's greatest mysteries: when the first galaxies came into existence!



(top); NASA, ESA, P. Oesch (Yale University), G. Brammer (STScI), P. van Dokkum (Yale University), and G. Illingworth (University of California, Santa Cruz)

(bottom), of the galaxy GN-z11, the most distant and highest-redshifted galaxy ever discovered and spectroscopically confirmed thus far.

Burton Barr Library Solar Event Feb 20

By Terri, Event Manager

The event, which ran from 10:00 am to 1:00 pm started out cool enough for light jackets but ended with everyone wanting a cool shower.

Attending from PAS were Sam Insana with his 8" scope with solar filter and his PST, assisted by Paul Facuna, Terri and William Finch with handouts and information about the club and a separate table showing with William showing the Sun through his PST.

Bruce, Ed and Bette Wurst also attended with Ed and Bruce using Bruce's PST, while Mike Marron and Ofelia Waters were there too sharing Mike's meteorites. Don Boyd brought his 6" and his solar filter.

Among the public attendees, we had a few who wouldn't look through the scopes, worried it might damage their eyes and others who couldn't get enough views, looking through all the scopes we had set up!

Thanks to Paul for helping with the scopes and thanks to the Library and Katy Spratt (from Bookmans) who set up this event and had a kid activity indoors during the time PAS was set up outdoors. Katy and the Library also provided bagels for breakfast.

Since this is a good location to do a solar event, Katy and I will be setting another one up for next winter or spring, when it isn't too hot to have this type of event.



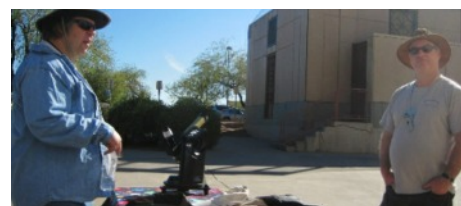
The Library provided the really cool sign next to Mike's table. Photo by Sam.



Burton Barr Library Solar Event with Mike's Meteorite table. Mike Marron and Ofelia Waters are seen at this table. In the background we have William Finch setting up his PST. Photo by Terri Finch.



Solar Event at the Library on Feb 20, 2016 with William (L to R), Don Boyd and Paul Facuna. Photo by Terri.



William and Bruce Wurst are seen at the Solar Event at Burton Barr Library on Feb 20. Even though this event was in Feb, it was really roasty outside. Photo by Terri.



Photo by Sam Insana.



Paul, Sam & Don setting up to do the Solar Event. Photo by Don Boyd.



This was a good spot to do this event. We were along the wall, with the Solar scopes. Around the corner (to R in this photo) is Mike and the entrance to the library. We were easily seen from the entrance which drew many people over to see what we were doing. Photo by Don.



And here is Mike's set up, around the corner from the main solar scope line up. It was a very successful event. The Telescope Team was awesome! Photo by Don.



Many people viewed through our Solar Telescopes at this event. It was a very good event. It was rather hot for February, but we enjoyed it! Photo by Sam Insana.



We had quite a set up at the Library. In this photo you can see William's back, and then from L to R we have: Bruce standing next to Sam Insana's scope, beyond and not in the view of this photo, we have Don's solar scope, then we have Sam standing in front of his PST, and Don. Photo by Terri.



William is on the left and his PST is on the table. Bruce is crouched, bringing the Sun into view in his PST. Ed & Bette Wurst are assisting at this event. Photo by Terri.



Mike showing his meteorites to this young gal and her mom at Burton Barr Library Solar event. Photo by Terri.

Telescope Workshop Feb 21 at Bookmans

By Terri, Event Manager

This was a successful event. We had Robert Parish attend to ask about eyepieces, Margie M. who brought her Orion Starblast and Cindy Marino with Ken who had questions about their Meade 12" Lightbridge.

PAS Members in attendance were Bruce, Ed and Bette Wurst, Alex Vrenios, Sam Insana, Rodney Fong, Terri and William Finch and Don Boyd. Many thanks to the telescope team for taking care of the attendees and thanks to Bookmans for providing the meeting location for this event.

After the event Alex and Diane, Ed, Bruce, Bette, William, Terri, Don, Rodney, Helen and Donna Zander celebrated Bette, Bruce and Helen's birthdays at Carlos O'Briens.



Katy Spratt and her helper for the kid activity happening along with the Telescope Workshop (seen in the background in this photo). Photo by Terri.



Dinner at Carlos O'Briens Mexican for a 3 person Birthday Party! Photo by Terri.



William & Don assist Margie at this event. Photo by Terri.

Cassini Mission to Saturn and its Moons

Review by Sam Insana

on the surface other than the Earth.

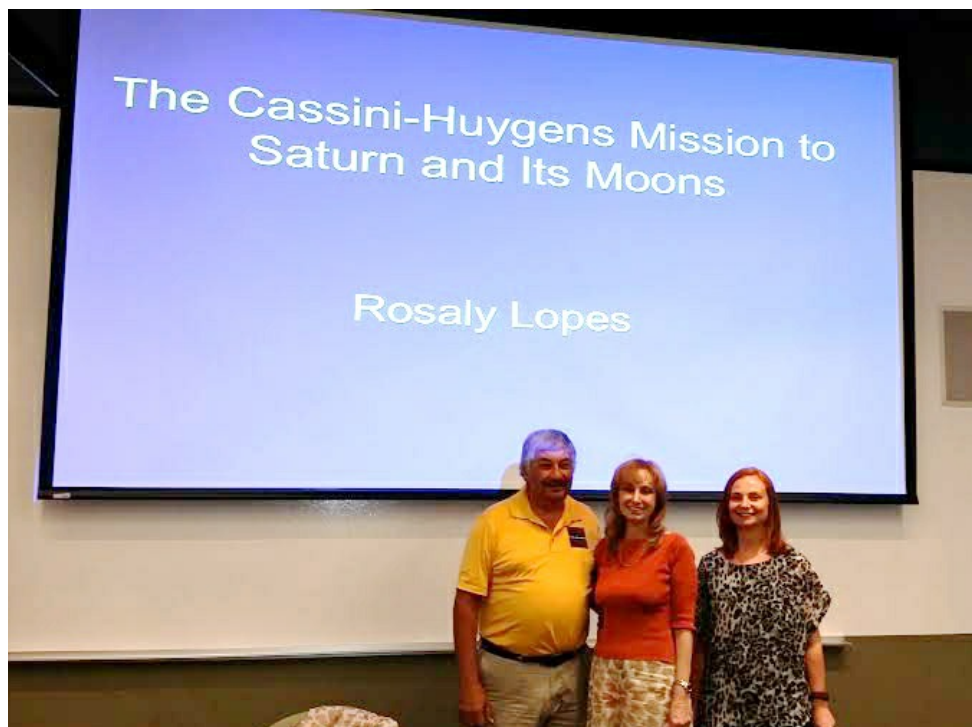
On February 26th, Dr. Rosaly Lopes, Senior Research Scientist and Manager of Planetary Science at NASA's JPL, delivered a very exciting talk on the Cassini Mission to Saturn and its Moons.

The photos and diagrams gave us a lot of information on a level that was scientific yet easy for the public to understand. About 40 people were in attendance including 5 PAS members: Jenny Weitz, Paul Facuna, Rodney Fong, Ted Blank and me.

The mission was launched in 1997 and arrived in 2004. The vehicle is 27 feet tall, the largest of any scientific payload ever sent into the far reaches of the solar system. Because it has 12 scientific instruments that are extremely sensitive, it couldn't be sterilized, so when the mission ends it will be crashed into Saturn so that it doesn't contaminate Titan or Enceladus, the 2 moons that could have life. Enceladus has active volcanoes that have organic plumes. There is also a global ocean. Titan has a dense organic atmosphere with hydrocarbons, that was penetrated by the Huygens probe that went all the way to the surface. Radar was also used to penetrate the clouds. There is a crust of frozen water with hydrocarbon particles on top. There are rivers, lakes and seas of liquid methane. It is the only place in our solar system that has flowing liquid

The photos were incredible and we all wished the talk was longer than one hour. However, Dr. Lopes has a very busy schedule spending most of her time analyzing the voluminous data being received from the spacecraft.

At PVCC, Cassini Mission Lecture Dr Rosaly Lopes on Feb 26. Also in this photo are Sam Insana and Jenny Weitz. Photo provided by Sam.



Black Mountain Campus Star Party Mar 10

By Terri, Event Manager

This was a large “STEM-tastic” event that started with afternoon indoor activities for the public, leading into our star party from 7pm to 10pm. I believe there were about 100 in attendance through the evening. The telescope team included George Sabo with his scope, Sam Insana with his 8”, Christine Mintzmyer with her 10”, Eric Steinberg with his 22”, Pete Turner with his 9.25” and Leah Sapir with her 6”. Howard Moneta and Ray Adams also came with scopes, while William and I brought the handouts and talked to everyone who walked by to get down to the observing area. Mike Marron was set up indoors for the afternoon and then moved outdoors by my handout table for the evening portion of the event. Paul Facuna was traffic control (per PVCC rules). Don Boyd attended without his scope due to his car being in the shop, but helped me at the handout table.

The weather was completely clear which helped make a successful event. Many thanks to all who attended and to Loretta Mondragon for having us at event. Thanks also to Kevin, the Security officer who assisted us in getting past the heavy metal posts with our vehicles. We look forward to more great BMC star parties on Apr 28 and May 12. See you there!

Debbie from Meetup writes: Fun and

educational!!

Leslie from Meetup writes: My first time looking through a telescope. It was a wonderful night. Thanks so much.

Sam writes: On Thursday afternoon, March 10th, I attended the STEM party at PVCC Blk Mtn. Mike was there with his meteorites, and Paul was assisting him. There were dozens of other demonstrations and exhibits. One demonstration was how to draw your hand on a paper and have it look 3 dimensional. Others were: testing to see how different colors of the visible spectrum have different weights by putting colors on paper to see which colors move faster with capillary attraction, “magnetic goo”, a snowy white substance that expands when wet (the kind that is in diapers), model paper airplanes with lights and looking at insects with a microscope. My favorite was crushing life saver candies and mixing with vodka producing colorful and delicious drinks (they wanted to see my ID but I told them they had to be kidding). Jenny had her own exhibit, a wooden solar scope showing 2 sunspots on a white piece of paper.

After the STEM, PAS had 8 telescopes set up on the Observatory deck for the star party. During the first hour there were

about 50 students and parents and teachers, and another 50 during the next 2 hours, including some through Meetup who enjoyed the viewing. We showed the Orion Nebula, Jupiter, the Moon, M81 and M82 galaxies, M31 Andromeda galaxy, Perseus double cluster, Gamma Andromeda double star, and various open clusters.

Jenny, our PAS board of directors member-at-large and an Astronomy professor at PVCC was there the whole time coordinating with security to pull the 2 100-ton (or was it 1000 ton) steel posts from the entrance to the driveway and getting them to turn out the lights in the area. I am proud of Jenny and all our PAS members for working out a seemingly tough situation and making everything run so smoothly. Sam Insana, President of PAS

George Sabo (PAS Member) writes: Hi, Terri --I was really struck at how grateful people are that we hold star parties --even for a rank amateur like me, I was able to show interested people several things, and a couple of people were very interested in my astro binoculars - it gives them an idea of what they might want to get for themselves in the future. As usual, Howard was very helpful to me - I don't know what I would do without you people!!!

Antennas Apr 2

By Sam Insana

Seven PAS members, Eric, Howard, Peter, Earl, Dewell, Sam, and Frank, attended. PAS actually outnumbered SAC attendees by several people. There was also a man from Georgia with an \$8000 pair of Zeiss image stabilizing binos and a Lithuanian who lives in Wales, England where he struggles to find one clear night a month to observe. A French naturalist also attended. It was a beautiful night for stargazing at the Antennas. No wind or clouds. The temperature was 80 degrees at setup time and 55 degrees at 6 am when we packed up. We each had great views of many deep sky objects with our scopes and binos. One of the highlights was Omega Centauri, the largest globular cluster in our Milky Way galaxy. After we packed up the next morning, PAS members hit the \$9 all you can eat breakfast buffet off exit 103 on the way back to Phoenix. It was a delicious way to end a great PAS event.

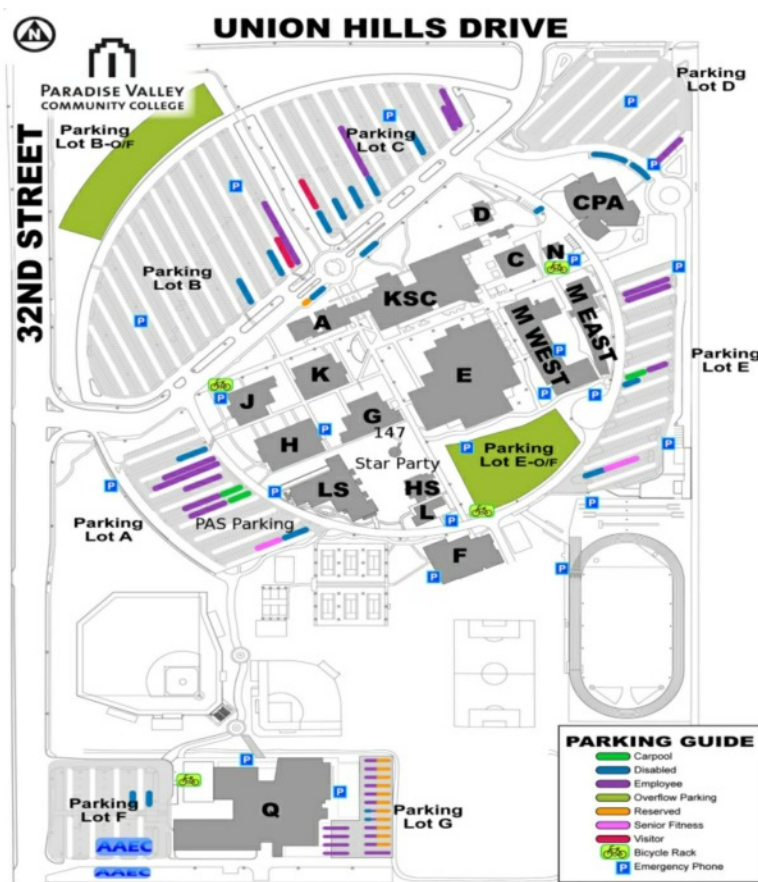


(L to R) PAS at Antennas: Pete, Earl, Dewell, Eric, Sam & Howard. Frank was out hiking with a French biologist looking for snakes. Photo provided by Sam.

All you can eat breakfast following all night Antennas star party on Apr 2. Attending breakfast was (L to R) Earl, Frank Dewell, Howard, Pete and Sam (not in photo). Photo taken by Sam Insana.

Map of PVCC Main Location

18401 N. 32nd Street | Phoenix, AZ 85032



2016 PAS GUEST SPEAKER LINE-UP

By Terri, Event Manager, Events@pasaz.org
PAS Meetings are held on Thursdays in Room LS-204 unless otherwise noted. Do you have an idea for a guest speaker? Email Terri the details. Here are the scheduled guest speakers at PAS:

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

Break: No PAS Meetings June, July or August

Sep 1: PAS Members and Guest Night - Sign up with Terri to do a 5 - 40 minute presentation. Earl DeLong "Eyepieces," plus Alex Vrenios and Sam Insana "2017 Total Solar Eclipse PAS Field Trip Update"

Oct 6: Rogier Windhorst, ASU "James Webb Telescope" **Nov 3:** David Williams "Dawn Mission to Vesta and Ceres"

What's Up For May?

By Rod Sutter, PAS Past President

Name	Date	Rise	Set
Mercury	05-15-16	05:06	18:30
Venus	05-15-16	05:13	18:49
Mars	05-15-16	19:56	06:03
Jupiter	05-15-16	13:29	02:18
Saturn	05-15-16	20:39	06:52
Uranus	05-15-15	03:53	16:40
Neptune	05-15-16	02:06	13:28
Pluto	05-15-16	23:00	09:12

All Times Arizona Time

Archway North School Apr 4

By Various Attendees

Terri Finch, Event Manager, writes: Attending this event from PAS was: Roger Anzini, Don Boyd, Bruce Wurst, Christine & Johnny Mintzmyer, Sam Insana, & Mike Marron.

Ellen Berger, School contact writes: Terri, We missed you last night, but I hope you are feeling better. I met Sam and the gang and enjoyed visiting with each one of your team. What a wonderful bunch of people you all are! Parents and students were pleased and really enjoyed the event. We are putting together a few thank you notes- What address would be the best to use? Let me know if there were any issues that I am not aware of. We want you guys to come back next year! Thank you! Ellen Berger, Archway North Phoenix

Sam writes: On April 4th, 6 members of PAS put on a star party for about 100 Archway North 3rd graders, parents and teachers. Don, Bruce, Christine, Roger, and Sam had their telescopes showing Jupiter, Orion Nebula, M3 globular cluster, Pleiades open cluster, Beehive open cluster,

Cancer Iota double star, Mizar double star and other delights. Mike, as usual, had big crowds because of his great meteorite collection.

Ellen our school contact brought us very good pizza, and a cooler filled with many bottles of cold water. However, there was one strange bottle in the cooler, and Mike grabbed it and wouldn't let go. Yes, that's right, it was the lone soft drink bottle. You guessed it, a Pepsi.



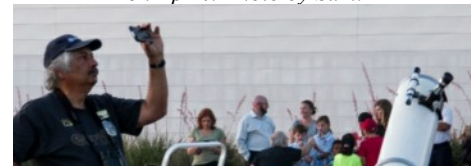
Ellen Berger & President Sam Insana: Ellen is a Teacher & Contact at this school. Awesome lady & wonderful to work with to set up this event. Photo provided by Sam.



Archway School set up. Bruce & Christine are chatting. Photo by Don Boyd.



Mike Marron, set up at Archway North School on Apr 4. Photo by Sam.



President Sam Insana setting up his telescope. Photo by Don.

By Terri, Event Manager

Attending the Messier Marathon at Mike's home in Carefree were: William and Terri Finch with food but no scope. We enjoyed the view through other people's scopes (thank you all!). Pete Turner with his scope, Christine Mintzmyer with her scope and charts, Leah Sapir with binoculars, Sam and Frank Insana with Frank's 16" scope, Alex Vrenios with a scope, Dewell and Wendy Howell with Dewell's scope, and Earl DeLong with his scope and of course, Mike Marron and Ofelia Waters as the host and hostess of the party.

Most of the group arrived around 4:30pm to 5pm, including the Finches to try some aerial photography with William's Quadcopter. The goal was to look at parking from the air though it didn't work out - we'll try again next time.

The Marathon was great! The sky was totally clear, though it was extremely cold which chased some of us home around 12:30am - earlier than we had planned.

Many thanks to our convivial hosts and thanks to everyone for the food and the great views through the telescopes! What I

really liked about this event was that those who were seeking objects were not in a rush to get the most objects, as much as they were into sharing the objects they found. This was Christine's first Messier Marathon and there was plenty help for her to find objects by viewing the objects through other's scopes to identify what she was looking for. I hope when I do the Marathon (it will be my first time as well), that I also am lucky enough to have the wonderful PAS Members available to share their knowledge and views.

Pete writes: I logged 64 out of the 71 objects I tried to view.

Leah writes: I decided to see what I could find with binoculars, and saw M42, M35, M36, M37, M44 and M13. I could have looked at M45 but it was behind a tree. on other occasions I have seen M31 and M6, M7, and M8 with binoculars, but I arrived too late for Andromeda and didn't stick around for Scorpius and Sagittarius. I looked at the Hyades but that's not a Messier object. I also enjoyed seeing some of the fainter objects in other people's scopes that

are much larger than my 6".

Sam writes: Only 23, but it was a lot of fun and a great night.

Earl writes: I logged 39 M objects at Mike's event.



Mike Marron and Ofelia Waters were the gracious hosts of this event. Photo by Terri Finch.



Alex at left, Frank behind 16" scope and Sam setting up for the Messier Marathon. Photo by Terri.

Messier Marathon at Antennas

Greg Schwimer writes: My son was a teammate with me for part of the run. He's 11 years old and did most of the work with the telescope until he fell asleep.

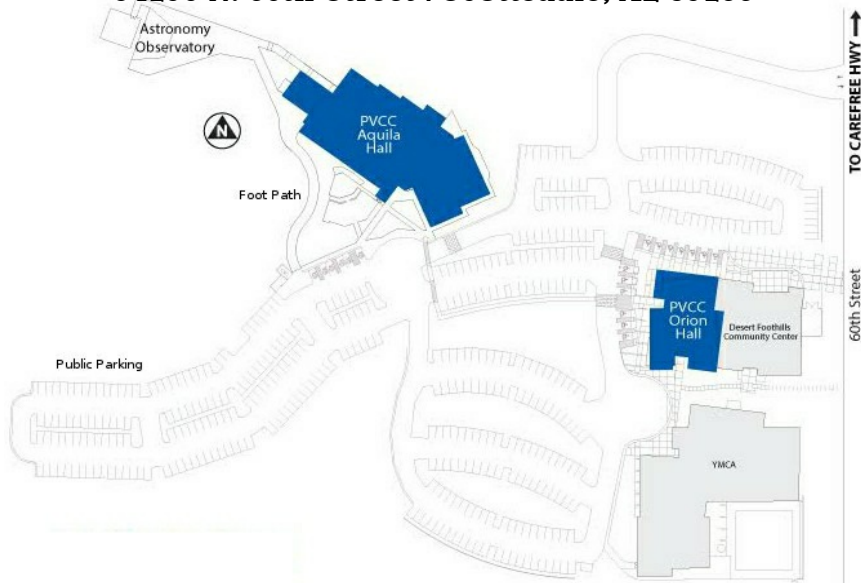
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Map of PVCC Black Mountain

34250 N. 60th Street | Scottsdale, AZ 85266



May 15 2015

Sunrise: 5:28

Sunset: 19:22

New: May 6

Q1: May 13

Full: May 21

Q3: May 29

