

PAStimes

Phoenix Astronomical Society
www.pasaz.org

October 2014
Volume 66 Issue 2

PHOENIX ASTRONOMICAL SOCIETY — ESTABLISHED 1948

October Second PAS Meeting

By Terri, Event Coordinator

This is an exciting meeting coming up. Marc comes to us from Flagstaff, so let's welcome him with lots of attendance. Bring a snack to share. Bottled water will be provided by President Bruce. If you haven't paid your 2015 membership dues,

it is a good thing to do it at this meeting. I will have Membership Forms available. Also, let's not forget the Raffle (it was forgotten at the last meeting). We will have the Magazine Swap and Book Swap for anyone wishing to bring items to swap.

Bring a friend and let's enjoy and share the evening together with our favorite topic - Astronomy! Doors open at 7pm, meeting begins at 7:30pm after a few brief announcements. §

Science at the United States Naval Observatory

by Marc A. Murison, Astronomer, USNO Flagstaff Station murison@nofs.navy.mil

The United States Naval Observatory (USNO) performs a variety of scientific and operational roles essential to the U.S. Navy, the U.S. Department of Defense, and the (global) general public. The USNO: 1) Provides a range of astronomical data and products to the DoD, NASA, and the public, 2) Is the official source of both time and celestial reference frame for the DoD and the United States, 3) provides Earth orientation parameters to the DoD and the public.

The astronomical data we provide to the public, NASA, and various government agencies includes products such as the Astronomical Almanac (and software and online equivalents), ultra-precise atomic-clock time reference, the world's most precise near-real-time orientation of the Earth, and high-precision positions of stars and solar system objects. In short, here at USNO we do time, Earth orientation, and astrometry. (Continued on [page 2](#))



PAS Meeting September Four

By Terri, Event Coordinator

Many thanks to the attendees of this meeting. We had 15 in attendance this time - it is always nice to have a good size audience. Many thanks also to everyone who brought snacks to share. Sam Insana brought the Jalapeno Poppers, Bruce Wurst brought the cookies, Bob Senzer provided the Graham Crackers, the water was also provided by Bruce.

We opened the meeting a little late, which though unintentional, actually, worked out well. David Broughton and one other person attended for the first time, with David joining that night. Welcome to PAS David!

We started the meeting with a few

announcements, and then had a slight delay while William Finch got Leah Sapir set up on Skype for her presentation. Leah did an excellent 2-part presentation about Williamina Fleming and then Professor Edward Pickering; the first part took about 20 minutes followed by a 10 minute break, and then the second half lasting 25 minutes. I'm glad I asked Leah to redo the Williamina portion of the presentation that she had originally done back at the May 2014 Meeting of the Minds. We didn't have a large attendance at that meeting, but her presentation was well worth having it repeated, especially along with Professor Pickering's story. Many thanks to Leah for Skyping



President Bruce Wurst giving Rodney Fong, New PAS Meeting Host, his position badge at the PAS Meeting on Sept 4.

with us on this awesome night. We then had a few minutes break while Alex set up to do his presentation called "At Long Lat." This

(Continued on page 10)

President / Librarian	Bruce Wurst	602-971-3555	President@pasaz.org
Vice President / Events Coordinator	Terri Finch	602-561-5398	VicePresident@pasaz.org
Treasurer	Mike Marron	480-488-3031	Treasurer@pasaz.org
Newsletter Editor	Don K. Boyd	480-963-7189	Editor@pasaz.org
PAS Host	Rodney Fong	602-432-4318	
Member-At-Large	Alfred P. Fantegrossi	603-548-8353	alfantegrossi@comcast.net
Member-At-Large	Jenny Weitz	602-787-6818	jennifer.weitz@paradisevalley.edu
Webmaster	Chris Johnson		Webmaster@pasaz.org
Rocketry Liaison	Jerry Belcher	623-328-9290	http://ahpra.org/launches.html

October Upcoming PAS Events

By Terri, Event Coordinator Events@pasaz.org

Events with links are public events - the link has more details about that event. Bring a friend!

Oct 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.
<http://www.pasaz.org/forums/calendar.php?do=getinfo&e=1374&day=2014-10-2&c=1>

Oct 3: School Star Party (Private)

Oct 4: Astronomy Day at Mike's. Potluck 5:30pm, Sunset 6pm, Dark 7:15pm. Arrive before dark for the star party. See more details in online calendar. Open to the public with a star party. Parking is limited so arrive before dark. RSVP is with Terri for Map and Directions. Sign up in Perfect Potluck with main dish & drink you wish to share.
<http://www.pasaz.org/forums/calendar.php?do=getinfo&e=1496&day=2014-10-4&c=1>

Oct 5: Free Telescope Workshop at Bookmans 19th Ave and Northern in Phoe-

nix, 3:30pm to 5:30pm. RSVP is required with Terri. When you RSVP, email the Make & Model of the telescope you need assistance with. We also assist with suggestions & advice on what telescope to purchase to do what you wish to do with it.
<http://www.pasaz.org/forums/calendar.php?do=getinfo&e=1163&day=2014-10-5&c=1>

Oct 8: CTCA Private Star Party

Oct 9: Solar Viewing & Kids event at Bookmans 1pm to 3pm. View through Safely Filtered telescopes, the Sun. Everyone Welcome. Meteorite Man should be there with his meteorites, come touch & feel real meteorites & learn more about them.
<http://www.pasaz.org/forums/calendar.php?do=getinfo&e=1497&day=2014-10-9&c=1>

Oct 16: Free Telescope Workshop at PVCC Main campus 32nd Street and Union Hills Rd 7pm to 10pm with Public Star Party. When you RSVP, include the Make & Model of telescope you need help with, and/or sign up for the Star Party portion of this event. RSVP is required with Terri.
<http://www.pasaz.org/forums/calendar.php>

[?do=getinfo&e=1489&day=2014-10-16&c=1](http://www.pasaz.org/forums/calendar.php?do=getinfo&e=1489&day=2014-10-16&c=1)

Oct 18: Private Star Party

Oct 22: CTCA Back Up Date (Private)

Oct 23: Huge Public Star Party at Black Mountain Campus of PVCC 60th Street and Carefree Hwy from 7pm to 10pm. Set up is 6pm for telescope. Everyone welcome. RSVP is requested with Terri. Weather Permitting. When you RSVP by email, please include the number in your party.

<http://www.pasaz.org/forums/calendar.php?do=getinfo&e=1492&day=2014-10-23&c=1>

Oct 25: Private Halloween Party at Mike's. Potluck at 5:30. Halloween Costume Contest 7pm. Star Party for PAS Members after Costume Contest.

Oct 30: ASU West Star Party 7pm to 9pm. See website for parking (fee for parking) and telescope set up. Public event. ASU West is at 47th Ave & Thunderbird Rd in Phoenix.
<http://www.pasaz.org/forums/calendar.php?do=getinfo&e=1498&day=2014-10-30&c=1>

PAS Membership Dues for 2015

By Terri, Event Coordinator

Now is the time, yes it is.... Your Membership dues are due for 2015. We suggest you take care of them now and avoid the risk of being bumped off the Roster, listserv, PASaz.org website on December 31, 2014, which is your deadline. At all the future PAS Meeting or other events in LS-205, I will be sure to have the Membership form with me. Remember, you NEED to fill out the membership form. It is proof you paid, for PAS. If you need a receipt, because you are paying cash, then please see Mike. Also, if you are paying by

check, please hand your payment to me, as I do the remote photographic banking for the club. There's a cute bank commercial about it - here's the link if you'd like to watch it:
<https://www.youtube.com/watch?v=8xItcpkmhcl>

Do get your membership dues for 2015 paid up. Here's the link to the Membership form:
<http://www.pasaz.org/forums/downloads.php?do=file&id=129>

US Naval

(Continued from page 1)

In this talk I will describe in more detail our astronomical and precise-time facilities (in Washington, DC, in Flagstaff, and in Colorado Springs), some history, a few of our current astronomical research activities (many of us are research astronomers), and the modern-day functions of the USNO. (Those of you with smart phones or other GPS devices may be in for a surprise.) §

How to Better Use PerfectPotluck.com

By Terri, Event Coordinator

So, you want to attend an event that PAS is hosting and they are having a potluck. How do you make use of PerfectPotluck.com?

We have been using PerfectPotluck.com for PAS events for about a year and a half, but we haven't seen many members use this means of creating an awesome potluck, every event. Therefore, I'm going to share with you the reasons why we have this option in use for PAS events.

When PAS has a potluck, it is always best to provide foods that can be eaten by the majority of the attendees. So, we request, that for PAS Potlucks, you, the guest, bring a main dish to share and a drink to share.

What are main dishes? A main dish would be something like a casserole, a pizza, chili, or some other dish that can be eaten as a meal by itself. It may or may not have meat in it, and it could be as simple as some bread, meat and cheese for a sandwich. But if you could consider it your meal for that night, all by itself, then that is a main dish. PAS asks that you provide for one more person than the number in your attending party. For example: if 3 people are in your party, provide 4 people's worth of food, as if this were the only thing you were eating for dinner that night. Using the example of Chili, if you would each eat 2 full bowls of chili, and 3 people are in your party, you should provide enough for 4 people, or 8 bowls worth of chili for the potluck. One crock pot worth usually covers enough for 3 people attending the event. Then, at the potluck, attendees will take $\frac{1}{3}$ or $\frac{1}{4}$ of a bowl to try the chili - with all the rest of the food, it

will then feed enough attendees.

For drinks, again, you should bring enough for 1 more person than your attending party. So, if you can drink a whole 2 liter bottle of pop by yourself in the 3-4 hours you attend the event, then with 3 people in your party, that's 4 - 2 liter bottles of pop that you should bring so everyone will have enough to drink. We ask that you just bring a 2 liter bottle or a 6 pack for every 2 persons attending. And no alcohol, please.

Now, how do you add this to Perfect Potluck? There are two ways to do so. 1) When you RSVP on our website, you will find a link on the same page to PerfectPotluck.com which takes you straight to the potluck for that event, or 2) just go to the main PerfectPotluck.com page and log in using the Coordinators name, which is usually "Finch" and some 10 digit pass word I created (also provided on the RSVP page). When you get into the page, you can see that there are 10 entries for the Main Dish, 10 for the Side Dish, 5 or so for the Dessert, 20 for the drinks, and several for the plasticware, plates and napkins. PAS purchases those items for these events - donations are very much appreciated. Find the heading you want, for example: "chili" and select "click to sign up." Put in your name in the two fields, and add an optional email address and phone if you want. However, if that is your RSVP for the event, then please do include that info, and then add what you will bring. Also, I request that you describe the dish specifically. An example would be "Church's Chicken" because some people are allergic to the MSG in KFC and if they know that if Church's Chicken is being

brought, they will have something they can eat and feel well afterwards. And remember to click on "Sign Up" once you are done entering all the items you wish to.

So for every person attending, there should be a minimum of 1 sign up in the categories of, main dish, side dish or drinks. The other categories are to let everyone else know if you are bringing something special, such as when we do a Birthday Party. If one of us is bringing a cake, we don't need 2 cakes for the party. Or for the Fireworks event, it is helpful to know that certain ice creams and popsicles will be at the event.

Why do we want to use PerfectPotluck.com? Primarily as a way to avoid duplicates, but also to help balance the offerings for the evening. If someone is bringing baked chicken from Safeway, we don't need to have additional chicken brought to the event, or if someone else is bringing Green Beans and Corn, then you might want to bring coleslaw, fruit or potato salad instead. One main dish and a drink is what we request for each potluck. Mike provides ice and bottled water for every event at his home.

So, as an event gets closer to the date, please take a moment to sign up with what you will bring to make that meal awesome. When astronomers are fed, their tummies are happy and the whole event is that much better for everyone! And feel free, anytime, to bring extras, such as a main dish, drink and then maybe dessert or a side dish or provide the plates, napkins or plastic ware for the party. It isn't a party if we don't have what we need to make it a party: food, friends, fun! See you at the next event!§

2015 Year in Space Calendar orders

By Terri, Event Coordinator

Take a look at these awesome calendars - I love both of the styles. Last year, I ordered the large wall calendar and it is amazing. Previous years, I had the desk calendar. Both are great for keeping track of your upcoming events and life and are full of information about astronomy and just great photos to enjoy. If you plan on ordering a Year in Space Calendar this year, put your order in with Terri. Be sure to let me know which style calendar you would like. I will be collecting

the monies for the 2015 calendars at the October and November PAS meetings. I will put the order in shortly after that, so that we can receive our calendars by the December PAS meeting and the holidays. Here's the links to have a preview of what's in the 2015 calendars: <http://www.yearinspace.com/wallcalendar>. 1 copy of these calendars is \$13. 2-9 copies are \$12 and 10+ copies are \$11 each. My goal is to get 10+ calendars ordered as a group so that we can save some money on the

order. We could get them for \$10 if we can get 36+ copies ordered, but we haven't been able to reach that goal at all in past years. So, if you want one or more, in cash, bring me \$12/calendar. If we get 10 copies ordered, I will refund you \$1. See me at the October and November meetings to order your calendars and be sure to check out the web page to see how wonderful these calendars are. Thanks for your order. §

Lecture #4 in Carefree Aug 9

By Terri, Event Coordinator

An awesome lecture, well done by Mike. PAS members in attendance were Alfred Fantegrossi, Eric & Ora Steinberg, William & Terri Finch, Rodney Fong, Sam Insana, Bob Senzer, Paul Facuna, Don Boyd, Pete Turner, and Kevin Harcey. The evening started with just a few members, warming up some great food. Many thanks to everyone who brought food to share! Dinner started about 5:40pm with the lecture beginning about 7:05pm and running until 8:40pm. The talk, which was recorded, was very well done, well organized and

made for a great evening. After the presentation, we got together and watched a movie "Final Days of Planet Earth." We all wished Bob Senzer a great Birthday. He turned 30 today!

Rodney writes: Get together at Mike's was enjoyable as always. Mike's presentation was full of interesting factoids. A few of us stayed late to watch a long movie about Alien Invasion. It was ok - Sleep is over rated! Also, the Moon was out in all its glory and lit up the night sky.§



Opening screen to Mike's Lecture on Aug 9. Photo by Terri

PAS Meeting of the Minds Sept 11

By Terri, Event Coordinator

It was a wonderful meeting. We set up and started at 7pm though some people were late arriving, probably due to not knowing we were starting early. We had 14 members in attendance plus Kevin Adams our photographer for PAS Events (you can see some of his photos in the PAS Gallery).

PAS Members in attendance were: Eric and Ora Steinberg, William and Terri Finch, Bruce Wurst, Rodney Fong, Don Boyd, Earl DeLong, Alex and Diane Vrenios, Kevin Witts, Howard Moneta, Mike Marron, Alfred Fantegrossi and Darlene Ahlefeld. Many thanks to everyone who attended and who brought snacks to share. Water was provided by President Bruce.

We started the evening with the PAS Meeting of the Minds Agenda, which we discussed for a good while.

Here's what we talked about and the results:

1) Should we have a grill stored at Mikes for potlucks? This was brought up at the meeting because sometimes there just aren't enough main dishes to share, especially for those with dietary restrictions. After some discussion, the grill idea was declined, since it became clear that members probably just wouldn't use it. We also talked about other options for the potlucks, including having a fund (collected at Mike's house, the day of the event) to cover amounts put out by PAS to buy pizza or a sub sandwich when there isn't enough food brought by the members. This idea is still up in the air.

Another thought was to allot an

amount of spending money to be used over the next several potlucks in which PAS would cover the cost of ordering pizza for those nights when food is in short supply. Neither of these ideas were completely agreed upon so, we decided that we should start a listserv discussion on the topic and see what comes from it over the next 5 months - until the next MOM takes place. We can then make a decision based on the ideas shared through the listserv, The listserv discussion has been started - please join in, if you are a PAS Member.

2) Should we give an Honorary Membership to Chris Johnson for the time in which Chris provides PAS with the website hosting? Resolved as of Sept 11, 2014, PAS now recognizes Chris Johnson, Webmaster, as an Honorary PAS Member as long as Chris continues to provide gratis hosting of the PAS Website. If he no longer can do that, the Honorary part of his membership is revoked. An email went to Chris with this info.

3) Should we record PAS Members' presentations and post them to the website for viewing by any who missed the meeting? Bruce brought up the topic and we informed him that we are already planning to do that. William and I have a camera that can do it as does Alex. Two of Mike's lectures from November and



President Bruce reads the Letter that came with the Certificate & Pin that Eric receives for completing the Hershell 400.



Eric Steinberg with his Herschel 400 Award. Photo by Terri.

The Planets This Month

By Leah Sapir

This month the moon will be putting on a special show for us: a total lunar eclipse will be visible from Phoenix in the early morning hours of October 8. The partial stages will begin at 1:15 am MST and end at 6:30 am. The total stages will be from 2:15 to 5:34 am, with the moon totally eclipsed from 3:25 to 4:24 am. Sunrise and moonset are around 6:30 am.

The color of the moon while it is totally eclipsed can vary from golden to reddish, with the light of sunrises and sunsets around the world. As the moon passes through the Earth's shadow, small amounts of sunlight are refracted through Earth's atmosphere – the same reddish light that we see in the sunrise and sunset. Some of this light reaches the eclipsed moon and is reflected back to us, causing the moon to glow with a golden or reddish light during the eclipse. What color will this one be?

This will be the second in a series of four total lunar eclipses scheduled for 2014 and 2015. The first was on April 15, and

the upcoming two will be April 4 and September 28, 2015. All four are visible from Phoenix. There are usually 2-4 lunar eclipses per year, but not all of them are total. A series of four total eclipses, known as a "tetrad", is rare but occasionally occurs. In the past hundred years, there were tetrads of four consecutive total lunar eclipses in 1909-1910; 1927-1928; 1949-1950; 1967-1968; 1985-1986; and 2003-2004. The next upcoming tetrad after this one will be in 2032-2033.

Elsewhere in the solar system - Saturn and Mars are still hanging around in our evening sky. Even though they are setting earlier and earlier, the sun is setting earlier too, enabling us to see the planets a little bit longer. Saturn sets around 8 pm at the beginning of October, and 6:30 pm at the end of the month. Mars sets around 9:30 pm at the beginning of October, and 9 pm towards the end of the month.

Mars starts out the month very close to Antares – only 4 degrees away, and right

above it in the southwest. The two reddish objects will be very closely matched, with Mars only a bit brighter. But from day to day, Mars will be moving westward into Sagittarius, while Antares and its constellation, Scorpius, fade into the sunset.

Uranus and Neptune will be in the east after sunset. Uranus is at opposition, and is up all night. Neptune passed its opposition last month, and will be up till almost 4 am at the beginning of October, and 2 am at the end of the month.

Jupiter is still a morning star, but rising earlier – 2 am at the beginning of October, and 12:30 am at the end of the month. Mercury begins the month as an evening star and moves into the morning sky in the second half of the month; but in both cases it is barely visible in the dusk or dawn twilight. Venus, which has been a morning star for most of this year, has faded into the sunrise and is too close to the sun to be visible this month. It will start to reappear in evening twilight in November, and will be prominent as an evening star in January.

(Continued on page 9)

CTCA/PAS Star Tours Aug 27

By Don K. Boyd

We had a good night. Cloud cover was about 10% when I got there about 6pm, so I took my scope up to the roof. Mike Marron got there about 6:30 and we waited for a few minutes for Terry Dancer. We then decided that we'd better go get something to eat before they closed the cafe. Terry showed up at just a little after 7pm and decided not to eat as he had had a late

lunch. We then went up to the roof where Terry and I set up our scopes. Terry got his set up early enough to catch a very small crescent Moon just before it set, showing something we had never seen before: Even at fairly high magnification, the moon was sharp as a tack... even as it was half way set. Terry said it stayed sharp all the way down below the earth!

We only had 1 customer all night. She talked to Mike for about an hour and then looked at Saturn, E.T. Cluster, Alcor and Mizar, and the Butterfly Cluster (M6). After she went back inside, because it was very humid and warm, Terry and I looked at the Double Cluster M3, Andromeda, and then called it a night, heading home about 10:00pm. Mike had left about 9:30. §

CTCA PAS Star Tours Sept 10

By Don K. Boyd

I got there right at 6 and took my scope up to the fifth floor. I then went to take the cart back down but when the elevator opened Howard Moneta was in it, so I gave him the cart and told him to bring his scope up. When he came back up with his scope we finally took the cart back down and went to get something to eat. About 7:30 we went back up and finished setting up for the evening. While Howard was doing his alignment our first customer came up. She said she knew she was early but that was the shuttle schedule. I gave her one of our flyers and had her sign in. After she had looked at the flyer for a few minutes Howard announced that he had Saturn. I then

went and tried to do an alignment...the scope said it had worked, but my gotos were way off, so I tried it again but they were still off. At that point, I told it to go to Saturn but had to find it manually. I then told the scope "this is where Saturn is" and then told it to find the Butterfly Cluster M6. It worked and she was very impressed. I then went to Alcor and Mizar, tried to sync on them and then go to the Double Cluster, but this time it did not work. Similarly I tried to find the double star Almaak, but again no joy.

Howard's scope fortunately was working well all night. He looked at Saturn, Mars, ET, and the moon. We had 3

customers...which is better than last month when we had 1 all night.

After the last customers had left I tried aligning my scope 1 last time and it worked. Before I tried it I noticed that my mount was slightly off pointing north, and I think that what had happened was, because I forgot my red flashlight, I could not see the alignment marks on my mount so it was not at 90 degrees declination: in order to get Polaris in the scope I had moved the mount in Azimuth, so in effect I was aligned on Kocab rather than Polaris. Once I got this corrected, then the scope worked correctly and found ET. §

PAS Meeting of the Minds Sept 11

(Continued from page 4)

December, will be re-recorded in LS 205 and we will set up to have Alex repeat his two short presentations and post them on the site as well. Earl and Eric have also done some excellent presentations - we like to capture all of them even if we just have a special meeting for recording them with higher quality.

4) We then turned to talking about the BMC (Black Mountain Campus) events that have been canceled by BMC due to construction of their new astronomy slab and building at PVCC BMC. Howard was wondering what we would want to do on the dates that are canceled and Mike put forward the possibility of moving our events to Ron's Observatory, the Grace Frederick Museum, Mike's house or even GCC. I am going to contact GCC to see if they want to do a star party at their campus on those Thursdays. Howard informed us that the location is good for a star party (Thank you Howard!). Mike is going to check into doing an event at Grace Frederick's Museum, maybe not on a Thursday, but the Saturdays following those dates.

[Under this topic, we also discussed moving the NSTS of Sept 20 to one hour later for the potluck start time, due to William having to do mandatory overtime that day, and then reviewed the Jan 31 PAS Social and the Jan 3 Music Jam, both at Mike's house.]

5) Bruce brought up the idea of having another training session on how to use the website. Chris or I could do this, so I will get in touch with him about this idea.

6) We then awarded Eric with his pin and certificate for completing the Herschel 400. Eric gave us a brief account of how he did it, how long it took and what fun it was after Bruce awarded him the certificate and the classy pin (see the September issue of the newsletter).

7) Next we had Alfred talk about his Asteroid Searching SIG. Alfred started up this SIG in hopes that other PAS members would be interested in doing this with him. The initial 2 meetings did not produce any member involvement, so Alfred talked about the exciting part of finding asteroids based on the data that is sent to him and processed by his computer. If you are interested in this SIG, let me know so I can hook you up with Alfred and you can find NEO's that might be hazardous to the health of humans on Earth. Many thanks to Alfred for sharing this with the attendees.

8) Alex did a presentation called "How High is the Moon." This was a fast paced and interesting topic on calculating the height of a lunar feature from earth. Alex went through how the math was figured out, how the info can be derived and how he got close to the correct answer. Interestingly, he pointed that a good deal of the

data on that feature ("Pico Mons") is incorrect on the Internet. Alex mentioned a good fun book that he says he has worn out: Exploring the Moon through Binoculars and Small Telescopes by Charrington.

We took a short break and then watched an hour long video called "The Science of Doctor Who." I told everyone that it could also be the Science of Star Trek or the Science of Life since it was really about black holes and the possibility of time travel. Some members left early but I do wish to thank the hard core folks who stuck around to the end of the meeting: William and Terri, Bruce, Rodney, Don, Alex and Diane, and Mike.

I wish to also acknowledge that it was great to see Alfred and Darlene again - we've missed them at events lately!

Our next Meeting of the Minds is set for Feb 12, 2015 in LS-205 and will probably also begin at 7pm just so we have time to get everything into the schedule before we lose the use of the computer at 10pm. See you there!

Alex writes: That video (The Science of Doctor Who) was a LOT more interesting than I expected it to be. What a mind Einstein must have had.

Space Place in a Snap!

NASA's Space Place is pleased to announce a new way to learn about science—[Space Place in a Snap!](#) These brief, narrated stories are engaging and entertaining, and they come with a downloadable poster, too. In our first episode, we tackle the ques-

tion of how our solar system came to be the place it is today. Check it out: <http://spaceplace.nasa.gov/solar-system-formation>.

You can also find great interviews

from our Space Place Live! series as well as Space Place in a Snap! at the NASA's Space Place You Tube channel at: <http://www.youtube.com/user/nasaspaceplace?feature=watch>.

Mike's Lecture #5 Sept 13

By Terri

An excellent night was had by all attendees. This was a busy night - delicious food was shared, the people were great fun and Mike's lecture was fantastic! This is the one lecture Mike does that I really enjoy! His other lectures are great too, but this is my favorite.

In attendance from PAS were 12 Members: Rodney Fong, William and Terri Finch, Don Boyd, Bob Senzer, Sam Insana, Howard Moneta, Mike Marron, Alfred Fantegrossi, Eric and Ora Steinberg, and Alex Vrenios. Guests attending this event were: Anna, Pat and Pam Kielbowicz.

Many thanks to the attendees for being supportive of Mike's Lectures. This Lecture was called "Upcoming Astronomical Disasters," beginning at 7:35pm and finishing by about 9pm. Many thanks to Mike for hosting this event. We hope to see more in attendance at future lectures by Mike.



Twinkle, twinkle, variable star

By Dr. Ethan Siegel

As bright and steady as they appear, the stars in our sky won't shine forever. The steady brilliance of these sources of light is powered by a tumultuous interior, where nuclear processes fuse light elements and isotopes into heavier ones. Because the heavier nuclei up to iron (Fe), have a greater binding energies-per-nucleon, each reaction results in a slight reduction of the star's mass, converting it into energy via Einstein's famous equation relating changes in mass and energy output, $E = mc^2$. Over timescales of tens of thousands of years, that energy migrates to the star's photosphere, where it's emitted out into the universe as starlight.

There's only a finite amount of fuel in there, and when stars run out, the interior contracts and heats up, often enabling heavier elements to burn at even higher temperatures, and causing sun-like stars to grow into red giants. Even though the cores of both hydrogen-burning and helium burning stars have consistent, steady energy outputs, our sun's overall brightness varies by just ~0.1%, while red giants can have their brightness's vary by factors of

thousands or more over the course of a single year! In fact, the first periodic or pulsating variable star ever discovered—Mira (omicron Ceti)—behaves exactly in this way.

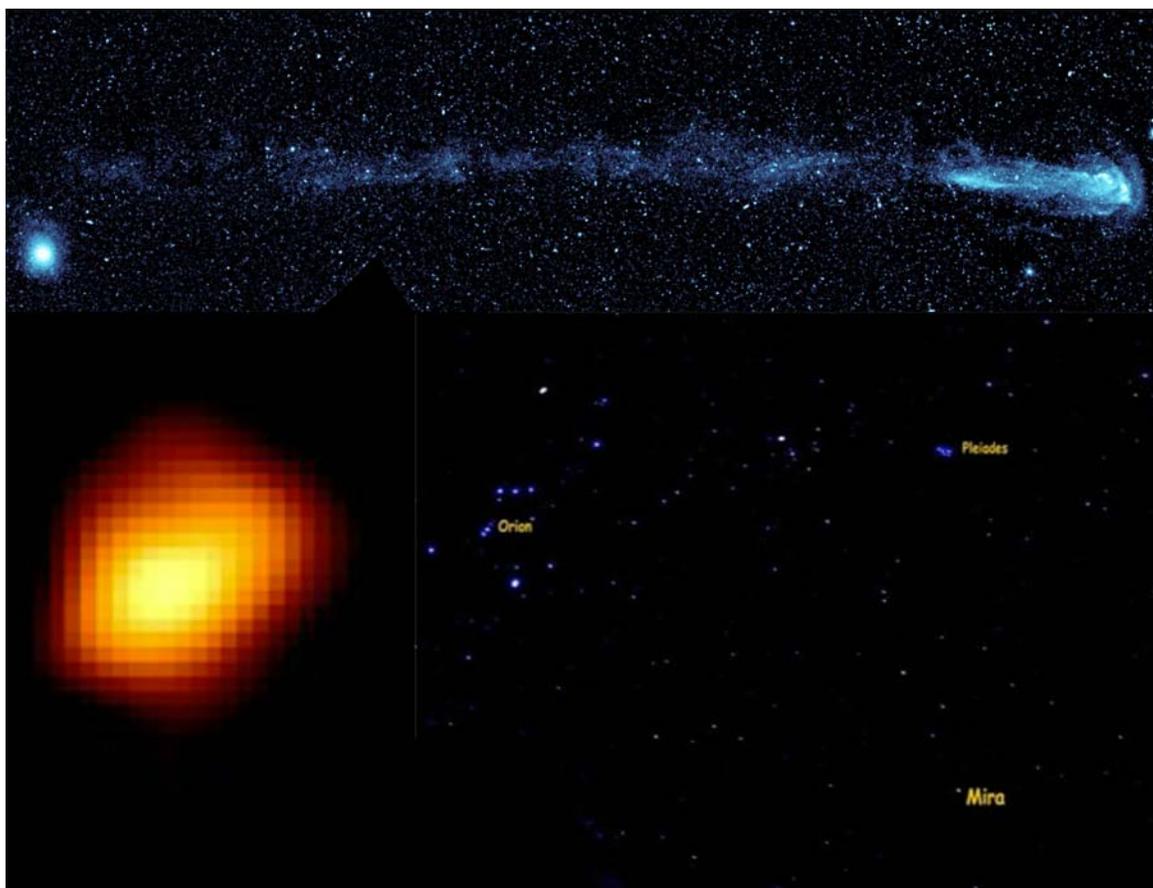
There are many types of variable stars, including Cepheids, RR Lyrae, cataclysmic variables and more, but it's the Mira-type variables that give us a glimpse into our Sun's likely future. In general, the cores of stars burn through their fuel in a very consistent fashion, but in the case of pulsating variable stars the outer layers of stellar atmospheres vary. Initially heating up and expanding, they overshoot equilibrium, reach a maximum size, cool, then often forming neutral molecules that behave as light-blocking dust, with the dust then falling back to the star, ionizing and starting the whole process over again. This temporarily neutral dust absorbs the visible light from the star and re-emits it, but as infrared radiation, which is invisible to our eyes. In the case of Mira (and many red giants), it's Titanium Monoxide (TiO) that causes it to dim so severely, from a maximum magnitude of +2 or +3 (clearly visible to the

naked eye) to a minimum of +9 or +10, requiring a telescope (and an experienced observer) to find!

Visible in the constellation of Cetus during the fall-and-winter from the Northern Hemisphere, Mira is presently at magnitude +7 and headed towards its minimum, but will reach its maximum brightness again in May of next year and every 332 days thereafter. Shockingly, Mira contains a huge, 13 light-year-long tail -- visible only in the UV -- that it leaves as it rockets through the interstellar medium at 130 km/sec! Look for it in your skies all winter long, and contribute your results to the AAVSO (American Association of Variable Star Observers) International Database to help study its long-term behavior!

Check out some cool images and simulated animations of Mira here: http://www.nasa.gov/mission_pages/galex/20070815/v.html

Kids can learn all about Mira at NASA's Space Place: <http://spaceplace.nasa.gov/mira/en/>



Images credit: NASA's Galaxy Evolution Explorer (GALEX) spacecraft, of Mira and its tail in UV light (top); Margarita Karovska (Harvard-Smithsonian CfA) / NASA's Hubble Space Telescope image of Mira, with the distortions revealing the presence of a binary companion (lower left); public domain image of Orion, the Pleiades and Mira (near maximum brightness) by Brocken Inaglory of Wikimedia Commons under CC-BY-SA-3.0 (lower right).

Bookmans Telescope Workshop Aug 10

By Terri, Event Coordinator

We had 4 public RSVP's 3 of whom showed up for this event. Everyone attending was interested in learning what scope to purchase as a starter scope. Candi didn't show up. She RSVP'd and then emailed me a cancellation closer to start time of the event - I thanked her for canceling, through email. The other three attendees were Steve Findling and his wife, David Broughton and Ray Adams. Steve & his wife were taken care of by Don. David sat with Rodney and then moved over to get

more info from William and Terri. Ray was helped by Don and William. Later we (of course) turned our discussion to Doctor Who. Many thanks to the PAS members who attended and helped out: William & Terri Finch, Don Boyd, Bob Senzer and Rodney Fong. As we were leaving Bookmans for the evening, a gentleman stopped William, Don, Rodney and me to ask when we would be doing another Sidewalk event. I guess it is time to set up a few more of those events, soon. §



Don Boyd & Bob Senzer assisting more attendees of this event. We had a nice size group this time. Photo by Terri.

Coppercon / FANtasm Aug 23

By Terri, Event Coordinator

It was a great day for an event. Hotter than one wanted it to be outdoors, but the convention was held inside at the Hilton Garden Inn in Avondale. The event was scheduled for 7pm to 10pm, with set up beginning at 6pm. In attendance from PAS were: William and Terri Finch, Don Boyd, Rick Cunningham, Kevin Witts and Mike Marron. Many thanks to Mark Boniece for inviting PAS to this event, and providing food and drink.

The day started with an awesome "trip". I mean "trip". William and I arrived about 10 am but on our way into the front of the hotel, I didn't see the divider curb and stepped on it wrong. I twisted my right ankle something fierce, fell to the ground and put a huge hole in my left knee. A bunch of attendees and hotel employees ran to my rescue. One attendee of the event offered me a Band-Aid. Many thanks - I didn't catch his name but it was definitely appreciated. Seeing that I was OK, they left, but I walked and limped on it all day for fear that if I took off my shoe, I wouldn't get it back on. I didn't get to see my swollen ankle until about 1:45 Sunday morning when we got home and I finally removed my shoe.

Mike had arrived shortly after my fall. Then, Kevin arrived and soon after, Rick. William and I went to the different presentations, visited the dealers room, met a really nice dude, Emmett, from whom we later bought some stuff. We enjoyed the day a lot, less the bad ankle. We also got to enjoy 2 of David Williams' presentations and meet a bunch of nice people. We hung out with our

friend Janet White, who offered me a chair to rest on, at the Registration Desk.

For dinner, they served very good nachos. We ate and then went to set up our scope. Don arrived around the time, and we had Mark block off an area for the scopes. Don started to set up there, but realized he had left some important parts behind, so he helped Mike with keeping an eye on his meteorites and me with handouts. Rick set up his dob, Kevin set up out front, showing Neptune, and Mike had a crowd most of the night. We started the event about 7pm but the sky wasn't dark yet, so we didn't show much in the beginning. We had Saturn and Mars most of the early night, and then as it became dark, we grabbed other objects. Once Saturn and Mars set, it wasn't easy finding objects. We showed the E.T. Cluster, but the Ring Nebula was very washed out.

Our agreement was to be there until 10pm at which time some of the group walked over to Culvers to get some additional food. The Telescope Team, William and I stayed until 11:50pm when we gave up on the attendees coming out to see us and packed up. I estimate we had about 75 public visitors at our scopes and we gave out fliers to most of them. If invited to do this event again, I will definitely sign PAS up for it.

Many thanks to my Telescope Team. And thanks to them for taking care of me and my twisted ankle. I see this taking a very long time to heal. Photos are provided by Rick Cunningham. Thank you Rick. §



Rick Cunningham set up at Coppercon on Aug 23 with his telescope. This is facing towards the entrance to the Hilton Garden Inn in Avondale. Rick asked me to take the photo using his phone. Photo by Terri, but using Rick's phone.



Facing South, we have Don Boyd with his back to us, William Finch and his scope Photo by Rick Cunningham.

Bookmans Telescope Workshop Sept 7

By Terri, Event Coordinator

The event started with everyone from PAS there before William and I were able to arrive. Running late is never fun, but we got everything set up before the students showed up. From PAS we had: Rodney Fong, Howard Moneta, Earl DeLong, Don Boyd and William and Terri Finch as Telescope Teachers. We also had new member David Broughton as well as returning member Angie Lee. Bob Senzer joined us along with a friend of Angie's named Jim. Kate, Kerrie, and 2 other walkins took PAS info with them.

Jim and Jill were first to arrive with their Astromaster 114 EQ. They were assisted by Don & Rodney.

Angie's friend, Chris also brought his 6" Schwaar scope to get assistance with. Angie had brought her son Michaelangelo

and daughter Sophia. They were terrific - I'm glad I got to meet them. We also learned that they were Doctor Who fans, since Angie, Sophia and I wore our Doctor Who shirts, and David bought a Doctor Who poster for his wife. Wow, what an excellent, exciting event. Many thanks to those who joined us from PAS. Your assistance is always welcome and appreciated. We look forward to the next Telescope Workshop at Bookmans on October 5th.

After this great event, the group went to Carlos O'Brien's for dinner. In attendance were Eric and Ora Steinberg, Bob Senzer, Rodney Fong, William and Terri Finch and Howard Moneta. It was an awesome dinner, after an awesome event. Many thanks to my fantastic Telescope Team!



Rodney Fong assisting Jim and Jill at the Telescope workshop. Bob Senzer is sitting in front. It was a very successful event.

Photo by Terri.

The Planets This Month

(Continued from page 5)

The Orionid meteor shower will be visible on the night of October 21-22. Since this is right before a new moon, we should have dark skies and a good view. The best time to watch for meteors is between midnight and dawn. The meteors in the Orionid meteor shower are actually bits of dust left behind by Halley's comet along its orbital path. So, even though Halley's Comet won't be back for another 45 years, we can see bits and pieces of it burning up in our atmosphere. The Eta Aquariid meteor shower in May is also produced by remains of Halley's Comet, but that meteor

shower isn't as prominent as the Orionids. The Orionids are very fast meteors, and have been known to produce glowing trails and fireballs.

On the night of October 10-11, the full moon will follow the Pleiades across the sky from east to west, from 8 pm to dawn. On October 11-12, the moon will accompany the Hyades, starting around 9 pm. The third-quarter moon will be close to the Beehive Cluster on the morning of October 16, moving east to south from around 1 am to dawn. On October 17 the moon will be between the Beehive and Jupiter, from 2 am

to dawn.

On October 24 and 25, the crescent moon will be near Saturn, low in the west after sunset. And on October 27 the moon will be close to Mars.

The first quarter moon will be on October 1, full moon on October 8, third quarter on October 15, and the next new moon on October 23.

Join us next time when we continue to explore the Arizona sky. And till then - wishing you clear skies, and happy observing!

Fisher Space Pen Manufacturing Plant

By Bob Senzer

I went to the Fisher Space Pen Manufacturing Plant in Boulder City, NV on January, 3, 2013. Unfortunately, they ceased providing factory tours over 10 years ago, but it was still interesting. The plant / offices consist of about a block long stretch of metal buildings. As far as I can tell, all of the space pens and refills are produced at this location. If you're visiting, they have a store that stocks all of their

products, some of which are extensively discounted. I have been using their products ever since I first heard about them. The product line actually precedes the development of the space pen, itself. The original bullet pen was created in 1948 and modified later to accommodate the space pen refill. The space pen were created in 1965 and used on space missions since 1967 by the US and Russian Space Agen-

cies. All of this information is available on the web as well as at their website, <http://www.spacepen.com>.

Needless to say, I acquired a few more space pens ... Worth the trip if you're in Southern Nevada or visiting Hoover Dam, the major attraction in Boulder City. Any way, will not say any more as this is beginning to sound like an advertisement. ***

NSTS in Carefree Sept 20

By Terri, Event Coordinator

It was a night to remember. Good food, great friends (PAS Members), and a good time viewing. Yes, I said viewing. The weather forecasts called for 20% chance of rain, 50%+ cloud cover, and so, the Weather Watchers couldn't make a decision as to have the event or cancel it, so we waited a little longer into the day to call it on or off. Eventually, we decided to have the event.

In attendance from PAS were: Rodney Fong without a scope, Don Boyd who brought his scope but didn't take it out, William & Terri Finch without scopes, Eric Steinberg with his 16" scope, Bob Senzer without a scope, David Broughton (New PAS Member) who doesn't have a scope, Mike Marron, the host of the party and Howard Moneta who brought his 14" dob.

We started with postponing the potluck until about 6:45 because there was an accident on the way up to Mike's house that everyone had to go on a detour to get around. So, we waited for Eric to arrive, who was the last to contribute to the potluck. This worked out well. We ate, enjoyed a great dinner and because there weren't that many in attendance, we all fit

around the table in Mike's kitchen. It was a very good meal. Many thanks to Howard for bringing the corn and green beans. Thanks to Don for bringing a delicious meatball pasta dish. William brought the pizza. Ofelia Waters, in her absence, provided the potato salad and grapes. Some really good raviolis were provided by Bob. There were many desserts available. Eric swung by and picked up tortilla chips, salami & cheese on his way to Mike's. The Tortilla chips were to go with the salsa that Mike and Ofelia provided.

After dinner, we went outside with the intent of setting up scopes, but from about 7:30 to 9:30, there were too many clouds, so we sat outside in a circle and talked, watched the clouds, did a few pop quizzes about the night sky - questions provided by Terri & Eric. Eric also shared some info about the night sky, and Howard was right in there with fun facts.

About 9:30, the sky cleared enough that Eric and Howard decided to set up their scopes. We saw many awesome objects between the two scopes. The clouds kept getting in the way but that didn't stop us

from observing. We observed until about midnight, and then Eric got a text from his wife and decided he needed to go home, so I helped him pack up so he could get out quicker. Howard then decided to pack up too, but he stuck around. And after Eric left, the sky cleared. :)

So, the rest of the group stayed for the movie William picked up on our way to Mike's "Captain America - The Winter Soldier." And after watching the movie, the party broke up about 2:30am. It was a very good party, and many, many thanks to Mike for hosting it.

Although the "class" didn't actually happen at this event, many thanks to everyone who did their homework, & submitted it. An email with the accumulated objects, nicely formatted, was sent out to everyone through the list for future use. We didn't see the turnout we were expecting from this class, however I appreciate Eric and Howard setting up their scopes and really sharing some great views with the rest of the attendees of this party. I look forward to the next Night Sky Training Session (NSTS) in 3+ months. See you there!§

PAS Meeting September Four

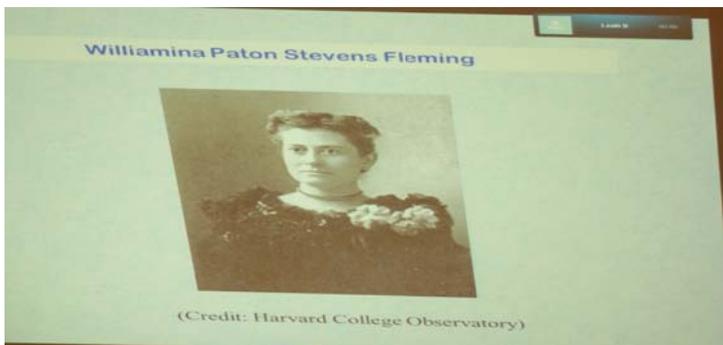
(Continued from Page 1)

was a very good presentation, a bit over 15 minutes. The information and presentation, both were really interesting and I thoroughly enjoyed it. I hope the attendees did as well.

Some topics that were discussed at this meeting, or announced, were: Joe Collins is doing better, after his stroke, but for now, Don Boyd is taking over as CTCA Liaison in Joe's absence. Don requested one more scope to attend the Wednesday Sept 9 CT-CA event. Sam Inzana reminded us that the Flagstaff Festival of Science with 10 days of free science events starts near the end of this month (Sept 19) - we should all consider attending some of these fun events. After the meeting, I sent out the link to go to the

2014 Flagstaff FOS page to see what they are doing this year. Here's the link, if you missed it: www.scifest.org.

This was a great meeting, with informative guest speakers, lots of friends visiting and having a great time. We look forward to the October PAS meeting. Many thanks to all who paid their 2015 Membership Dues. §



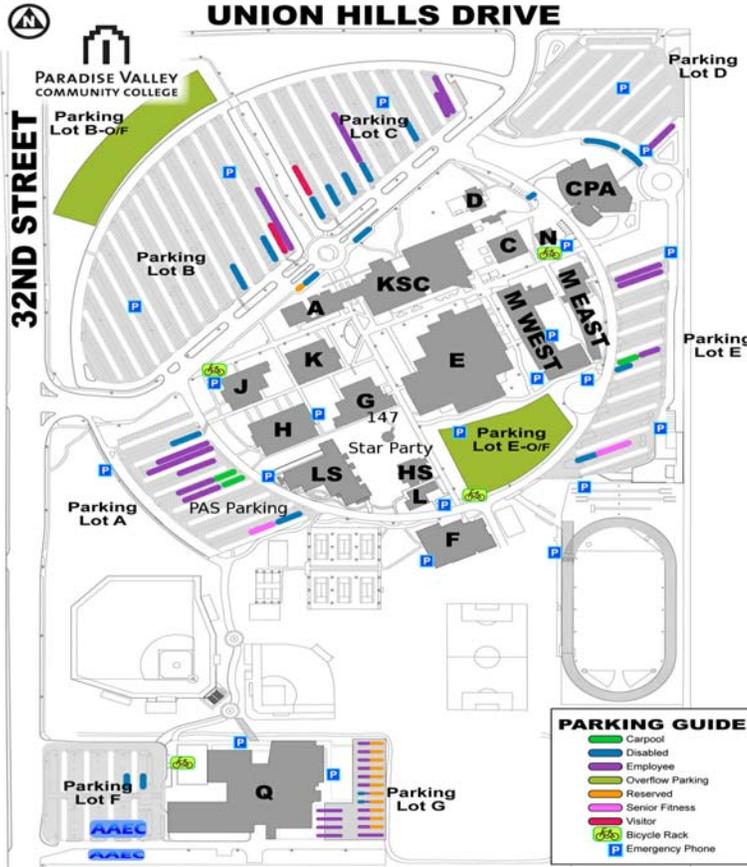
A slide from the presentation Leah Sapir did about Williamina at this meeting. It was an awesome!



Alex Vrenios sharing his ideas on "At Long Lat." Very informative!

Map of PVCC Main Location

18401 N. 32nd Street | Phoenix, AZ 85032



Map of PVCC Black Mountain

34250 N. 60th Street | Scottsdale, AZ 85266



October 2014

Sun	Mon	Tue	Wed	Thu	Fri	Sat
			1	2 PAS Meeting	3 School (Private)	4 Astro Day in Care-free
5 Telescope Workshop	6	7 Uranus at Opposition	8 Draconids Meteor Shower Peak & CT-CA (Private)	9 Bookmans Solar Viewing & Solar Eclipse	10	11
12	13	14	15	16 Telescope Workshop	17	18 Star Party (Private)
19	20	21	22 Orionids Meteor Shower Peak & CT-CA Back up	23 BMC Star Party	24	25 Halloween Party (Private)
26	27	28	29	30 ASU West Star Party	31	

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

To:

2013/2014 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.

Nov 6: David Williams: Topic "Mars: From Mariner to Curiosity & Beyond: A History of Mars Exploration."

Dec 4: Eric Steinberg: Topic "When things go Boom! Novae, Supernovae & Their Remnants."

Jan 8: Earl DeLong "Our Journey to Pluto: Nasa's New Horizons Mission"

PAS is incorporated in the state of Arizona as a non-profit, scientific and educational 501(c)(3) 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 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 October?

By Rod Sutter, PAS Past President

Planets

Name	Date	Rise	Set
Mercury	10-15-14	06:48	17:52
Venus	10-15-14	06:22	17:51
Mars	10-15-14	11:24	21:08
Jupiter	10-15-14	01:30	15:00
Saturn	10-15-14	08:54	19:27
Uranus	10-15-14	17:28	06:01
Neptune	10-15-14	15:44	02:56
Pluto	10-15-14	12:23	22:43

All Times Arizona Time

October 15 2014

Sunrise: 06:32

Sunset: 17:54



Q1: October 1



Full: October 8



Q3: October 15



New: October 23