

PAStimes

Phoenix Astronomical Society
www.pasaz.org

February 2013
Volume 64 Issue 6

PHOENIX ASTRONOMICAL SOCIETY — ESTABLISHED 1948

“Things that go Bump into the Earth” in Room LS-201

Dr. McCarthy has 28 years of full-time teaching experience in physics, mathematics and astronomy. He received his masters in physics from the University of Michigan and his doctorate in physics from the University of Texas at Dallas; his dissertation topic, The Calibration of an Ultra-High Energy Muon Hodoscope and Search for Gamma Ray Anisotropies. While teaching and running the observatory at St. Mark's School in Dallas, in 1994, he interfaced a small research telescope to a 386 computer,

allowing for automated control. As a physics and astronomy teacher at St. Paul's School in New Hampshire, he developed wireless connectivity to small computer controlled telescopes, using a Palm Pilot. He is currently teaching physics and math at ITT and has published a number of articles in the area of Physics teaching. His latest astronomy project is to develop remote observing to be used in connection with college astronomy curricula. ***



Bigger Meeting Room at PVCC LS-201

By Jenny Weitz

Facilities has given us permission to switch rooms for PAS meetings from LS-205 to LS-201 which has twice the capacity. Based on the great turn-outs and speakers you guys have had, this is a welcome opportunity :-)

Terri Finch writes: Many thanks to Jenny for getting us a bigger meeting room. This room will be our new room for 2013. Please attend all PAS General Meetings with Guest Speaker and PAS Meeting of the Minds in this new room. See you there! ***

PAS Meeting Review Jan 3

By Terri, Event Coordinator

Awesome Guest Speaker: James Ashley! This meeting was moved to Q120A due to the campus being closed for the holidays. I like that room. We had round tables to sit at this time. Many thanks to everyone who brought snacks: Popcorn brought by Sam Insana, Cake & Cookies brought by Ed Wurst, Darlene Ahlefeld brought Grapes & Puffs, Bruce Wurst brought the case of water, and there were a few more snacks for which I didn't see who brought them, but many thanks are sent their way.

The meeting opened with President Bruce who welcomed everyone to the meet-

ing. I reminded Bruce we had a bunch of new people there, so we did Officer introductions and had the new people introduce themselves. Rick and Chris were new to the meeting and Bruce Swift. Then Bruce turned the meeting over to me in which I passed the attention to Sam. Sam talked about the Jan 15 event at Black Mountain Campus for which he is the RSVP for that event. Jerry took about 10 minutes to talk about the upcoming arrival of the Comets and how we should set up public events to view them and where. He also announced the rocket launch Feb 23 and 24. There is a



See "Jan Meeting Review" on page 4.

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February Upcoming PAS Events

By Terri, Event Coordinator

(PAS Events below, are listed from beginning of this month, to next PAS meeting)

Feb 5: CTCA (Private) 7pm to 9pm. RSVP with Joe. PAStimes Star Tour Members only.

Feb 7: PAS Meeting 7pm to 10pm PVCC Main Campus LS-201. Please note change in room for Spring 2013. Bring a snack to share. Bring a friend! Everyone welcome!

Feb 9: Dark Sky Antenna's Star Party (Private) Event begins at sundown and goes to dawn. RSVP is with Eric for this event. Bring you own everything.

Feb 9: Estrella Observatory Star Party (private) 3pm Solar Viewing, 5pm Potluck, 7pm Star Party. RSVP is with Yves or Terri for this event. Sign up in Potluck & bring your scope!

Feb 10: Free Telescope Workshop at Bookmans 3:30 to 5:30pm. Bookmans is at

19th Ave & Northern, N.W. Corner. We meet in the musical instrument section. RSVP is required with Terri Events@pasaz.org. When you RSVP, mention the type of scope you are seeking assistance with so that we may match you up to a teacher who can help you. This is also a good class to attend to get ideas on what type of scope you should purchase.

Feb 14: Black Mountain Campus (BMC) Public Star Party 7pm to 10pm. RSVP is with Terri. Bring everyone you know! Black Mountain campus of PVCC is located at 60th Street and Carefree Hwy S.W. corner. Awesome dark sky location!

Feb 19: CTCA Back up date for Feb 5.

Feb 21: Free Telescope Workshop at PVCC main Campus - 32nd Street & Union Hills- 7pm to 10pm. RSVP is required with Terri Events@pasaz.org. When you RSVP - leave number in your party and type of scope you are seeking help with. This is also a good class to attend to get ideas on

what type of scope you should purchase. And this is a public Star Party!

Feb 27: School Event (Private) from 6pm to 8pm. RSVP is with Terri Events@pasaz.org. Pizza being provided.

Feb 28: Meeting of the Minds (MOM's) 7pm to 10pm PVCC Main campus Rm LS 205. If there aren't enough topics to hold a meeting, this meeting gets canceled. Tentative.

Mar 3: Free Telescope Workshop at Bookmans 3:30 to 5:30pm. Bookmans is at 19th Ave & Northern, N.W. Corner. We meet in the musical instrument section. RSVP is required with Terri

Mar 5: CTCA (Private) 7pm to 9pm. RSVP with Joe. PAStimes Star Tour Members only.

Mar 7: PAS Meeting 7pm to 10pm PVCC Main Campus LS-201. Bring a snack to share. Bring a friend! Everyone welcome! ***

Meeting of the Minds Nov 29

By Terri, Event Coordinator

At the Meeting of the Minds (MOM's) on Nov 29, we had a great meeting! I wish to thank everyone who brought snacks to share.

We opened the meeting with the MOM's Agenda. Topics and results of the discussion were: 1) Pizza Party in May. Last May we had a pizza party that cost PAS \$130. The snack fund box only collected \$8 in donations to PAS for the pizza. It was decided at this meeting we would go back to the way we did the pizza party the year before, and charge \$1 per slice for the pizza. This would ensure that PAS is reimbursed for the pizza, a little better than \$8 of the \$130 spent. Some of you might wonder why we want to do this? PAS shouldn't have to cover the whole cost of pizza every

May meeting. If we just bring in half of what we spent on the pizza, the budget would be ok and we won't have to raise dues. Recall, if PAS is going in the hole, with expenses, due to the dues not covering those expenses such as insurance, the Astro League membership, and other expenses PAS has, then we can keep our dues low, at the \$25 per household, and not have to raise the dues to cover the cost of having a party. All snack fund funds that are collected at the May PAS Meeting, go to the Treasury to repay PAS for the pizza. It is the one meeting where by the snack fund goes directly to PAS. All other times, the snack fund is in my care, and used for buying the snacks for the next month's meetings. So, the May meeting will have a requested \$1

per slice of pizza, and please RSVP your pizza. A total of about 1 extra pizza will be ordered for those who want extras but didn't ask for it when they RSVP'd. You can RSVP any amount of slices, as long as you donate to PAS, \$1 per slice, please.

The next topic we discussed was the donated telescopes, to PAS, which are now in President Bruce's care. These are scopes and parts that were donated to PAS over the years. Some are useful to other people, but are not that useful to PAS. So, it was decided that Bruce or other PAS Members, may sell of those scopes and parts to raise money for PAS. The first such selling would be at the PAS Swap Meet, held at the December PAS meeting. After that, the items could go in a garage sale or on Ebay or CraigsList.

Host of PAS

By Terri, Event Coordinator

Due to Alzheimer's, John Pulis is now in a nursing home and unaware of his surroundings. He has been battling Alzheimer's for several years and everything was fine up to about a month ago when it hit him hard. John is currently the oldest member of PAS, having just turned 90 last Spring and has been with PAS for many years. We will

miss his stories and how well he welcomes everyone to PAS. Last May, we voted in a New PAS Host to help greet people and sign them in at the Meetings. Mikey Webb is the new PAS Host and now that John is no longer able to fill the position of Host at the Meetings, we will see more of Mikey holding the Host Position. In Mikey's ab-

sence, President Bruce fills in. It is sad to see a great friend like John, leave PAS, but it is great to have an awesome New Host to take his place. We wish John well. No other news has been heard about his condition. I will keep everyone informed as I find out more. See you at the meeting! ***

Rocket Launch Feb 23-24

By Terri Finch

There will be a huge Rocket Launch on the weekend of Feb 23/24. Jerry Belcher is the Rocket Liaison. He was telling us, at the January PAS Meeting, all about the upcoming Rocket Launch. If you are interested in attending (this is NOT a PAS event but some of us like to attend) please visit the webpage: <http://ahpra.org/launches.html> or contact Jerry Belcher (listed on Page 2 in the Officer's List, for more information. Enjoy! ***

Arizona Science & Astronomy Expo (ASAE) Nov 10

By Bob Christ

For years the amateur astronomy community has enjoyed the huge NEAF (North-east Astronomy Forum) event. We, in the southeast, would have to travel thousands of miles to attend this distinctive show held in Suffern, NY, and this prevented many of us from attending. Each year videos of NEAF would be posted on the Cloudy Nights Website and, between drools while watching them, I wished we could have access to such an event in our region.

This year the NEAF folks put up a trial balloon, the ASAE, and it was a great success for the attendees and exhibitors. Held at the Tucson Convention Center on November 10th & 11th, every indication gives one reason to expect this will now become a most welcomed annual event.

Approximately 50 manufacturers and retailers (OPT & Woodland Hills) engaged in this inaugural event and Celestron and Meade had large spaces filled with product. One manufacturer from Italy even made the investment to showcase their belt-driven German equatorial mounts that were not only functionally precise but incredibly beautiful as well. As a result of this event, their products will probably become available to the US market.

Shows like this provide an opportunity, not only to personally engage with people

you have done business with from afar, but also take advantage of great show prices. Sales tax was not charged, and the use of cash further sweetened the deal one paid on the aggressive show pricing posted by both the manufacturers and retailers. I was able to fulfill my target "wish list" at significant savings.

Notables presented throughout the two days and the content was most engaging. In particular, astronaut Don Pettit who recently returned from duty on the ISS, manifested the "necessity is the mother of invention" phrase.

He took many thousands of photos during his off-hours and had a particular challenge when taking long exposure shots; namely needing a camera that tracked to prevent star-trailing. Amateur astronomers have addressed this issue on terra firma simply with a "barn door" platform approach. Two pieces of plywood are hinged and the camera is mounted on one of the pieces. A motor-driven screw assembly (actually a bolt) rotating in synch with sidereal time is then used to raise the "door" upon which the camera is mounted. Obviously these materials are not readily available on the ISS so Mr. Pettit had to exercise his creative genes.

He found pieces/parts of a no longer used technology onboard the ISS from which he crafted the barn door portion. Crafting the screw assembly was a different matter. A Russian supply ship was going to be destroyed after it left the ISS so he "appropriated" a bolt from it figuring they would never know (how could they?). He attached a cordless drill to drive the screw and determined the correct speed at which to turn it and the photos he took using this Rube Goldberg of a tracking mechanism are remarkable.

Mr. Pettit also described the mechanisms onboard used to recycle/dispose of body waste: a most interesting discussion.

Raffle tickets were provided as part of the entrance fee and the drawing, held on Sunday afternoon, did not require one to be present to win. Prizes ranged from magazine subscriptions, to books, to discount coupons from the retailers, to optical tube assemblies (up to a 6" refractor), to a Go-To scope.

I would heartily recommend that you attend this event next year, one that will probably be even larger when other astronomy-related suppliers understand the viability of this event. ***

Ads in PAStimes

Celestron 8" Telescope for sale. Asking \$799 with lots of accessories & hard case. Call Michael at: 623-399-9989 or Email inquiries to snmzap@gmail.com. See flier at this link: <http://www.pasaz.org/forums/downloads.php?do=file&id=203> Cash & Local Pickup ONLY.

Tropper Star Party Dec 8

By Terri, Event Coordinator

Many, Many thanks to Scott Tropper for another successful, awesome event at his home in North Scottsdale. Scott has been having events at his home for the past 4 years, sometimes 2 times a year. And every time we do an event, he has been a most gracious, awesome host! This event featured a chef who did a fantastic spread of food. Scott also had a band playing indoors for his guests to enjoy. Attendance at this event, not counting PAS Members or Dennis Young, was probably about 70. Everyone attending seemed to totally enjoy the evening. Many thanks to Scott for inviting

us to be part of this awesome event. In attendance with a scope were: William Finch with a 10", Terri Finch with an 8", Eric & Ora Steinberg had their 22", Dennis Young brought his 28" and did Solar Viewing before the Sun set, Don Boyd had his 6", Bruce Wurst had his 20" and Mike Marron brought his Meteorites. The evening was perfect, a bit cold, but the views were great! Thanks to the PAS Telescope Team for their attendance. We look forward to the next event being set up in May 2013. Thank you Scott!

Don writes: The food was excellent, The salmon was really good and the Brie things...not sure what else they had, were excellent, as were the mushrooms. I showed the double cluster and I had quite a few comments about how many stars you could see in it and one guy asked if I could just point the scope at any place in the sky and see that many stars. I said it was very unusual for that many stars to be all in one place. I also showed the Et cluster, Pleiades, Neptune, Uranus, Jupiter and the Coat hanger, I was able to get about 2/3 of it in my scope.***

Bookmans Telescope Workshop Dec 9

By Terri, Event Coordinator

At the Dec 9 Bookmans Telescope Workshop, we had 2 RSVP's bring their telescopes for assistance. It was a very productive workshop & both participants seemed to leave content with the info we had provided them. Don Boyd, William Finch and myself were the Telescope Teachers for this event. William was very helpful. He used his laptop to show examples of telescopes, talk about items that are needed for scopes, find links for these items, provided them to me to forward on to the attendees, through email so that they would have the data they needed. Linda brought her 70mm telescope. Ron & Marla brought their telescope, too. Linda had arrived right at 3:30, so we helped her first. Some of the suggestions to help her enjoy looking through the scope more, was to get

a Rigel Finder and a few other things for her scope, including better eyepieces. So, William sent links to me, and I forwarded them on to Linda through email, so when she left the Telescope Workshop, she'd have the links needed to look up the info we were suggesting. While Linda was there, Marla and Ron showed up with their scope, and we had them pull up a chair and listen to what we were sharing with Linda, and then we did the same for them, once Linda left. Everyone had left by about 5pm, so we had a half hour of time left. Don, William and I discussed my scope's enhancement of a Go to system, and Don had wanted to look at the manual for it, so he looked through the manual and shared with us what he found that he knew I would need to know. We discussed my scope for quite a while and

then it was time to leave. We left later than scheduled, 6pm, but mostly because we were deep in discussion. It was a great event, very successful, and the people attending were wonderful. We hope to see them at our events in the future. Many thanks to the attendees for RSVP'ing and attending, and many, many thanks to Don & William for assisting the attendees such that they left pleased with the info we shared with them. The next Bookmans Telescope Workshop is Dec 30. We hope to have a large turnout with everyone having purchased or received telescopes for Christmas. We may need the assistance of more PAS members at this next event. See you there! ***

PAS Meeting Review Jan 3

Continued from page 1

separate article in this issue about the Rocket Launch, please check it out. I shared the upcoming events for January. Jerry also provided me with the Dart Trophies, 1st & 2nd place. I showed them to the attendees. You'll have to go online to the Photo Gallery and visit the pictures from this meeting, to see them. That first place trophy, I want

it! Let's get some good competition going for it!

Then we turned the night over to James Ashley whose topic was Meteorites on Mars. This was very interesting and James did such an awesome job of the presentation that at the end of the evening, 6 PAS Members came up to me to ask that I ask James

to return to do another presentation. The next topic everyone wants to hear about is Lunar Caves. I will be scheduling James for that presentation. Many thanks to James for his presentation as it was very interesting and fun! Many thanks to all who attended. See you at the Next PAS Meeting on Feb 7th. ***

Meeting of the Minds Nov 29

Continued from page 2

All monies collected from these sales would be put into the PAS Treasury.

Then Sam brought up the next two topics. Dec 13 Black Mountain Campus star party, and Dec 22 PAS Music Jam. We discussed these events, & announced them for those who didn't know of these events.

The evening then turned to 2 presentations. Alex Vrenios did a short but very interesting presentation on "Finding Neo's." Neo's are Near Earth Objects. Very

good presentation. Chet Schuler then took over showing his Solar Eclipse photos & Venus Transit and how he created a movie of the Transit. Very interesting and a lot of work preparing the movies. He shared the Mercury Transit of Nov 8, 2006, Venus Transit of June 5, 2012 and Luna Transit of May 20, 2012 (Solar Eclipse). Lots of cool movies & still shots!

Attendance at this meeting was William & Terri Finch, Sam and Frank Insana, Don Boyd, Alex & Diane Vrenios, Jenny

Weitz, Mike Marron, Kevin Harcey, Chet Schuler, Darlene Ahlefeld, Jeremy & Suzanne Dietrich, Bette & Ed Wurst, & Eric & Ora Steinberg. There were several of Jenny's students in attendance, as well.

Along with the two mini presentations that were planned, Darlene shared a photo and story of her balloon ride.

Many thanks to everyone who did a presentation or shared something at this meeting. See you at the next MOM's. ***

Music Jam Dec 22

By Terri, Event Coordinator

In attendance at this 1st, possibly annual Music Jam, was Eric & Ora Steinberg, Mike Marron & Ofelia Waters, William & Terri Finch, Don Boyd, Sam & Frank Insana, Darlene Ahlefeld, Ed & Bette Wurst, Bruce Wurst, & Keith Smith.

We gathered for the food. There were pinto beans, Church's Chicken, Homemade Brownies, many desserts, and some other fine foods including fruits. Many thanks to those who contributed to the potluck.

As we were filling our tummies, Keith, the drummer, started warming up on his drums. Then it was decided, about 6:30, to start the Jam. So, we all moved into Mike's living room where Ed and Bruce had set up the keyboards, Keith was in the corner away from the couch, and the couch had room for everyone wanting to do percussion.

We had Keith on the Drums. Sam was running the Jam, so he counted each song to give us the timing, and then led us through it. He also played the keyboard, Bass Guitar, and Trumpet. Don was on keyboard and singing. Terri was keyboard, one song on the guitar, and most songs on the flute, and the latin songs on the wood sticks. Ed played the accordion through the whole Jam. Eric was on bass guitar & Recorder. We had Darlene on Tamborine, Ofelia on Maracas, Ora was tapping on an instrument. The collection of percussion people on the couch, were also singing. There were some really good voices in the group. Bruce

played the Banjo. The Jam went on for 3.5 hours. There was no break, and we covered about 40 songs out of one book, and about 15 songs from the other book that were the collection of songs we chose to do for this Jam.

Many thanks to Ed for putting together the music book. The copy machine broke in the process, so he had to go to Staples to get the rest of the copies made. We are thinking of doing this Music Jam again. We will not do it around the holidays, as we want more attendance, so, help us think up when to do it that all who attended and all who wanted to attend but couldn't, can. We don't want it in January, as that is the PAS Social. One big party a month is enough. And it can not be during the summer months or we don't have the Wurst's to attend.

Many thanks to Mike for having us at his home for this cool event. Many thanks to everyone who sang, tapped on a percussion instrument, played an instrument or two, and attended. It was fun having you there. Keith was very good on the Drums. A bit loud at times, but he kept us all in time.

My favorite part of the Jam was hearing Eric doing harmony on his Recorder to my flute playing. It was a nice sounds together. And Sam played some very nice Trumpet. Oh, and Eric was really good on the Bass Guitar. The other part of the Jam I really liked was playing. Just playing... haven't done that in a long time with a good

group of musicians. Thank you all for attending. I'm sorry, no pictures were taken, I forgot my camera. That's a first!

Sam writes: On December 22, PAS had a music jam at Mike's house. It started out at 5 pm with a very good potluck, with a variety of dishes from the membership. At about 6:45 pm we started the music jam with Ed on Accordion, Bruce on Banjo, Terri on Keyboards and Flute, Eric on Bass Guitar and Recorder, Sam on keyboard, trumpet and bass guitar, Don on keyboard and vocals, and a drummer, Keith, invited by Ed (Ed's student on Stand up Bass Fiddle). We played holiday songs and a vast array of other songs. We had audience members help out singing and playing rhythm instruments like maracas, claves, bongos, tambourine, and castanets. I personally liked the soothing sound of Terri on flute and Eric on recorder. A lesson to be learned by us if we do it again is to play a lot softer, especially the loud instruments like drums. In a small room, we only need a snare drum with brushes and a bass drum, no sticks, cymbals or toms. We could also use a microphone to help us hear the singers. Also, we played 3 hours straight without a break. Next time we should take 5 every hour to make it a more relaxing event. I want to thank Ed for arranging the music sheets for everyone, and Mike for letting us use his house. ***



CTCA Review Dec 27

By Joe Collins

Thursday 12/27 evening was a bit of a surprise. There was rain earlier in the day, but the evening sky was clear. The only deterrent from attendance was it was CHILLY. Temperatures dropped into the 50's after sunset and with a slight breeze the chill factor made it seem colder. I expect similar conditions for our first January event Tuesday 1/8/13, so it would be a good idea for hot refreshments: hot coffee or hot chocolate. Unfortunately, we haven't had refreshment service for the past four events, so I don't know if we can get this or not.

We had Mike Marron with his meteor-

ite display inside the Cafe. He had six patients/customers, several who engaged him in conversation for over an hour.

Don Boyd and myself manned our telescopes on the 5th floor garden terrace. Over the course of the event we had ten customers for viewing Jupiter and its moons, our Moon, the Pleides, the Great Nebula in Orion, Nu-Draconis (double star), Polaris (our north star), and about a dozen other astronomical objects that we could see in the full moonlight, many of them detailed in the handout we gave to caregivers and patients. Several patients were excited about

the write up about the 'Star of Bethlehem'. Everyone enjoyed the stargazing, but not the COLD! I am wondering if there is a portable propane space heater we could use for the next event to keep customers warm? Then more people would be willing to come up and view the night delights of the winter sky.

Don Boyd, myself and Renee Collins will be returning on Tuesday Jan 8th. I will send out a handout/flyer to be published tomorrow. Thanks to CTCA for hosting this events and for the support from the Loyalty and CancerFighter groups! ***

Bookmans Telescope Workshop Dec 30

By Terri, Event Coordinator

At the Dec 30 Bookman's Telescope Workshop, we had the assistance of some fine PAS Members as Telescope Teachers: Don Boyd, Earl DeLong, William Finch, & Bruce Wurst. Also in attendance was Terri Finch, Ed & Bette Wurst. There were originally 4 RSVP's due to attend, of which, only 1 did. 1 RSVP canceled about an hour prior to the start of the event. Thank you Bruce Swift for attending. We think the rain scared the other two RSVP's away. No word was heard from them about why they didn't show up. We also had one walk-in,

Chris.

While there, we met our new Bookman's contact for scheduling these events. I'd like to thank Katy Sprat for setting up for the event. She rearranged the Musical Instrument section nicely to accommodate many telescopes, and provided chairs and tables. What's cool about her taking over at Bookmans, for the previous awesome scheduling contact, is that Katy will be working on Sundays at Bookmans, so if we need anything, we just let her know. That's awesome. Thank you Katy!

Bruce Swift was looking to talk about his scope. Later on, we saw him at the January PAS meeting, which was a nice surprise. I was quite busy talking with Chris at this event, so Bruce Wurst went around taking photos with my camera, for me. Thank you Bruce.

It was a very productive event. Even without the extra RSVP's, we had enough to keep us busy helping the two who attended. Many thanks to Earl and Bruce Wurst for joining us. See you at the next Telescope Workshop! ***

Night Sky Network Pins

By Terri, Event Coordinator

The Night Sky Network Pins have arrived. There will be 24 of these pins with Award Certificates given out at the April 25 Meeting of the Minds. Plan to attend. With that many given out, you are most likely going to receive one, if you have done 3+ outreach events with PAS during 2012.

I put out a notice by email, asking for Nominations, and received very few this year. That is unusual. Last year, when I asked for nominations, I was reminded of

all the extra people who I might have forgotten to thank, for their outreach support, during 2011, in many nominations. So, think back through 2012 and if you were at 3+ events for PAS that were public, and assisted in some capacity to promote PAS, plan to be at this Award Ceremony.

I'd like to thank and congratulate each appreciated PAS helper / scope operator receiving these awards. If your first name starts with these letters, you need to be at

this Ceremony: A, B, C, D, E, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y or Z. this link: <http://www.pasaz.org/forums/showthread.php?p=1951#post1951> will have more details about this event. It will be updated as needed, so check it out prior to attending to know exactly what the plan is. See you at the April MOM's in Room LS-201 7pm to 10pm. ***

Estrella Observatory Jan 11

By Darlene Ahlefeld

I had fun, left with Rick at 10:00. We were the only ones using my scope. Yves had some software problems for awhile but everybody seemed happy. I found Orion nebula again, Betelgeuse, a group of stars above that (Orion's shoulder?), thought I had the sword but refractor orientation is still screwy....

Yves had a great spread, as usual, and some other additions. Pomegranate and mint salad was yummy (took me back to Morocco ca. 1957ish) and something triple yummy with sun dried tomatoes, green olives and some kind of cheese. ***



The Art of Space Imagery

By Diane K. Fisher

When you see spectacular space images taken in infrared light by the Spitzer Space Telescope and other non-visible-light telescopes, you may wonder where those beautiful colors came from? After all, if the telescopes were recording infrared or ultraviolet light, we wouldn't see anything at all. So are the images "colorized" or "false colored"?

No, not really. The colors are translated. Just as a foreign language can be translated into our native language, an image made with light that falls outside the range of our seeing can be "translated" into colors we can see. Scientists process these images so they can not only see them, but they can also tease out all sorts of information the light can reveal. For example, wisely done color translation can reveal relative temperatures of stars, dust, and gas in the images, and show fine structural details of galaxies and nebulae.

Spitzer's Infrared Array Camera

(IRAC), for example, is a four-channel camera, meaning that it has four different detector arrays, each measuring light at one particular wavelength. Each image from each detector array resembles a grayscale image, because the entire detector array is responding to only one wavelength of light. However, the relative brightness will vary across the array.

So, starting with one detector array, the first step is to determine what is the brightest thing and the darkest thing in the image. Software is used to pick out this dynamic range and to re-compute the value of each pixel. This process produces a grey-scale image. At the end of this process, for Spitzer, we will have four grayscale images, one for each for the four IRAC detectors.

Matter of different temperatures emit different wavelengths of light. A cool object emits longer wavelengths (lower energies) of light than a warmer object. So, for each scene, we will see four grayscale im-

ages, each of them different.

Normally, the three primary colors are assigned to these gray-scale images based on the order they appear in the spectrum, with blue assigned to the shortest wavelength, and red to the longest. In the case of Spitzer, with four wavelengths to represent, a secondary color is chosen, such as yellow. So images that combine all four of the IRAC's infrared detectors are remapped into red, yellow, green, and blue wavelengths in the visible part of the spectrum.

Download a new Spitzer poster of the center of the Milky Way. On the back is a more complete and colorfully-illustrated explanation of the "art of space imagery." Go to spaceplace.nasa.gov/posters/#milkyway.

This article was provided by the Jet Propulsion Laboratory, California Institute of Technology, under a contract with the National Aeronautics and Space Administration.



This image of M101 combines images from four different telescopes, each detecting a different part of the spectrum. Red indicates infrared information from Spitzer's 24-micron detector, and shows the cool dust in the galaxy. Yellow shows the visible starlight from the Hubble telescope. Cyan is ultraviolet light from the Galaxy Evolution Explorer space telescope, which shows the hottest and youngest stars. And magenta is X-ray energy detected by the Chandra X-ray Observatory, indicating incredibly hot activity, like accretion around black holes.

Arizona Sky

By Leah Sapir



On January 1, 1801, the Italian astronomer Giuseppe Piazzi was updating his star charts when he saw an 8th-magnitude star that hadn't yet been mapped. As he continued to observe it on subsequent nights, he noticed that it was moving! At first he thought it might be a comet, but it did not appear fuzzy, as comets usually are.

In the meantime, other astronomers at the time had been bothered by the large distance between Mars and Jupiter, and were sure that there had to be a planet there. When they calculated the orbit of Piazzi's new object, they were delighted to see that it orbited the Sun between Mars and Jupiter. Piazzi had found the missing planet! He named it "Ceres" after the Roman goddess of grain, patroness of Sicily, where Piazzi's observatory was located.

Within a few years, several more objects were discovered orbiting the Sun between Mars and Jupiter: first Pallas, then Juno and Vesta. When viewed through a telescope, these new "planets" did not appear as disks, like the other planets do. Even in a telescope they were point sources of light, resembling stars. William Herschel suggested naming the new objects "asteroids", meaning "star-like".

Eventually it became apparent that there was not one significant planet in the Mars-Jupiter gap, but many tiny objects that were much smaller than any known planet, and even smaller than the major moons. Today, several hundred thousand asteroids are known and charted, mostly located in the main asteroid belt between Mars and Jupiter. Asteroids are identified by a number (in order of discovery) and a common name, which can be chosen by the discoverer. Of the known asteroids, at least 26 are larger than 60 miles in diameter (100 km), and there are probably more than a million with a diameter of at least 0.6 miles (1 km). Still, even though we might think of the asteroid belt as a crowded place, the distance between asteroids is so great that if we stood on one of them, the closest asteroid would only be a 3rd-mag star, if it was even visible.

Ceres, the first asteroid discovered, is also the largest: about 600 miles in diameter. It represents $\frac{1}{4}$ of the mass of all known

asteroids. The next-largest are 2 Pallas, 4 Vesta, and 10 Hygiea, with an average diameter of 300 miles. Most asteroids are irregularly shaped; only the largest, such as Ceres, are massive enough for their gravity to make them spherical. (As a result, and due to the redefinition of small solar system objects by the IAU, the International Astronomical Union, in 2006, Ceres is now considered a "dwarf planet".)

The volume of all asteroids together would be less than half the size of Earth's Moon, and

the total mass of all asteroids is only about 4% of the Moon's mass. Of this, Ceres, Vesta, Pallas and Hygiea make up about 50% of the mass of all the asteroids.

Some of the smaller planetary moons are probably captured asteroids, including Mars's moons Phobos and Deimos, and the outer moons of Jupiter, Saturn, Uranus and Neptune. On the other hand, some asteroids, like 243 Ida, have their own tiny moons. There are at least 150 asteroids with moons, and also multiple systems where two or three asteroids of similar size are gravitationally bound and revolve around each other.

Several asteroids have been explored by spacecraft, either with a flyby or an actual landing. Some of the spacecraft that have visited or photographed asteroids include Galileo, NEAR ("Near-Earth Asteroid Rendezvous", now known as "NEAR-Shoemaker"), Stardust, Rosetta, and Deep Impact.

Asteroids are classified by composition into C-type (carbonaceous), S-type (stony or siliceous), and M-type (metallic).

About 75% of known asteroids are C-type; but possibly there might be more, since C-type asteroids are harder to see. These asteroids are dark gray in color, and have an albedo of 0.03, i.e. they reflect only 3% of the light they receive. They are composed of carbon compounds, clay and silicate rocks, and are located mostly in the outer part of the main asteroid belt.

S-type asteroids make up about 17% of the total. They are reddish or greenish in color, and have an albedo of 0.1 to 0.22. They are composed of iron- and magnesium silicates, along with nickel-iron metal. They are mostly found in the inner part of the main belt.

Most of the remainder are M-type. These are reddish in color, with an albedo

of 0.1 to 0.18. They are made of pure nickel-iron, and can be found in the middle of the main belt.

Besides these major groups, there are several other, rarer, types. For example, Vesta – which has a basalt crust – is in a class of its own. The basalt crust is a mystery, as basalt is usually produced only by volcanic activity, and we would not expect a tiny object like Vesta to have any volcanic activity at all.

Ceres, Pallas and Vesta are differentiated into layers, which could indicate an internal heat source. Vesta also has a very large crater about 300 miles in diameter, that goes below the crust and exposes part of the mantle.

On the other hand, some asteroids, like 253 Mathilde, which was studied by a flyby of the NEAR-Shoemaker space probe, are apparently just flying piles of rubble.

Asteroids are apparently leftovers from the formation of the planets. They are composed of material that wasn't able to accumulate into a planet because of Jupiter's gravitational influence.

About 95% of all asteroids are located in the "main belt", between Mars and Jupiter, about 2-4 AU from the Sun. Within the main belt are a few regions with no asteroids, known as the Kirkwood gaps. The location of these areas is a simple fraction of Jupiter's orbit; repeated conjunctions with Jupiter push any objects there into a different orbit.

On the other hand, some asteroids share Jupiter's orbit, especially at the Lagrange points (60 degrees behind or ahead of Jupiter) where a combination of the gravity of Jupiter and the Sun enables them to have a stable orbit despite their proximity to Jupiter. These asteroids are called "Trojans", because the first of them to be discovered was 588 Achilles. (Other groups with colorful names are also named after the asteroid that serves as a prototype.) It is possible that some of the other outer planets might also have groups of "Trojans" at their Lagrange points.

Asteroids in the outer solar system are known as "Centaur"; but some of these are more similar to comets than asteroids. And some asteroids might be the remaining cores of comets, when the outer layers of ices have evaporated away after repeated passes near the Sun.

Some asteroids cross the Earth's orbit,



Arizona Sky

and of course these asteroids are of more concern to us. (Ask any dinosaur.) These “near-Earth asteroids” include “Atens” which orbit the Sun inside Earth’s orbit; “Apollos” which are located just outside Earth’s orbit; and “Amors” which orbit a little farther away, up to 1.3 AU. Over 7000 near-Earth asteroids are known, with about 1000 estimated to be over 0.6 miles (1 km) in diameter.

Since asteroids have hit Earth in the past, we are now on the lookout for near-Earth objects that could be a danger. Even an asteroid that is “just” a quarter-mile in diameter could cause a global disaster. This is rare but could happen once in 100,000 years. On the other hand, smaller asteroids that could strike the Earth once in 1000 to 10,000 years could destroy a city or cause a disastrous tsunami.

Asteroids were at first discovered only by visual scanning of the sky, but in 1891 photography was first used. In a long exposure photograph, asteroids appear as streaks. Also, photographs taken of the same area on consecutive days could be compared visually to see if any objects had moved. Today, due to the need to identify potentially dangerous objects, the sky is scanned by automated systems that photograph images of the sky on CCDs and compare them by computer. These include LINEAR (Lincoln Near-Earth Asteroid Research) and NEAT (Near-Earth Asteroid Tracking). These systems have identified thousands of asteroids, including about 5000 in near-Earth orbits.

On February 15 we are expecting one of these visitors from space in our neighborhood: asteroid 2012 DA14, which will pass Earth at a distance of 21,000 miles – less than 1/10 the distance of the Moon. This will happen at 19:30 UT, which is around noon in Phoenix; so we won’t be able to see it, although European viewers will have a ringside seat. By the time it is night in Phoenix, the little asteroid will have gone merrily on its way and be too faint to see.

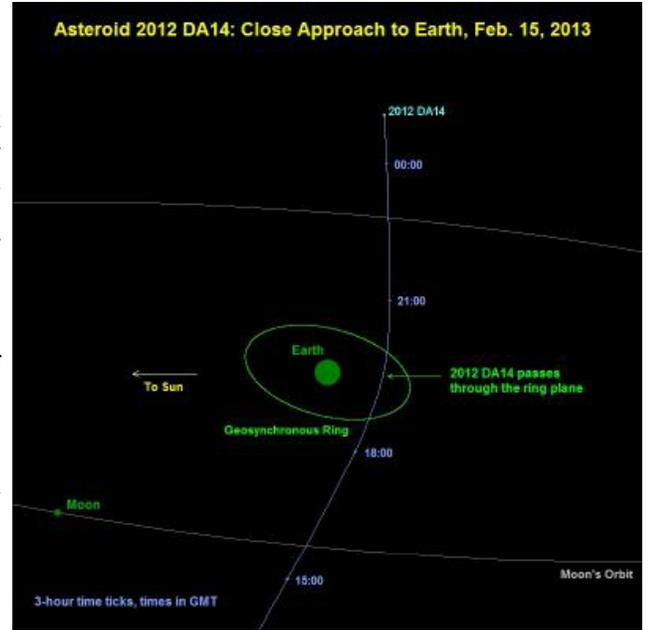
2012 DA14 is relatively small, only about 150 ft in diameter, with a mass of about 130,000 tons. If it ever hit the Earth, it could cause damage similar to the Tunguska event of 1908, which flattened trees for miles around Tunguska in Siberia. It usually passes by Earth around twice a year, but it is not expected to hit the Earth either this time or on any of its upcoming orbits for at least the next century (and probably

longer). NASA doesn’t even consider it to be a “potentially hazardous asteroid”.

This is also not the closest of the close approaches. Over the last 20 years, NASA’s list of near-Earth approaches includes nine that were closer than 1/10 of the lunar distance: tiny objects varying in size from 3 to 70 ft, and whizzing past the Earth at a distance of 3000 to 20,000 miles above the surface. The smallest ones would have burnt up in the atmosphere if they had been on a collision course with Earth; only the largest ones would have been a concern.

While we won’t be able to see 2012 DA14 from our area, we can watch some of its big brothers which are currently well-placed for viewing in our sky. Ceres and Vesta are now in Taurus, not far in the sky from Jupiter, and can be seen through telescopes and binoculars as 8th-mag stars. Watch them move from day to day and re-enact Piazzi’s discovery! Here is a finder chart for your viewing convenience: <http://tinyurl.com/bhtcyg7>.

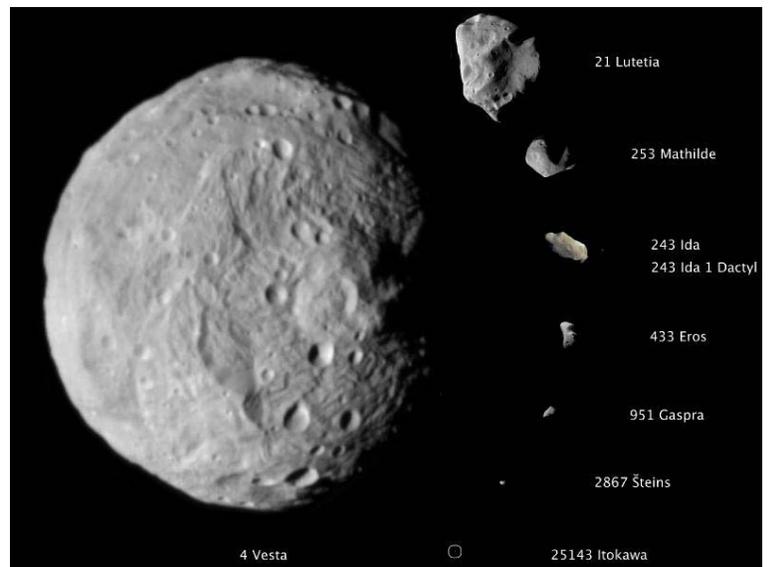
In other parts of the solar system, Mercury will be visible in the west after sunset around the middle of the month, from around the 10th to the 24th. Mars and Neptune will also be in the west, but only during twilight, and only at the beginning of the month. After that we will be losing them into the sunset. Uranus is in the west after sunset, and sets around 10 pm at the beginning of February, and 8 pm at the end of the month. Jupiter is overhead at sunset, and starting to set earlier: 3 am in early February, and 1 am towards the end of the month. On the other hand, Saturn is rising earlier, and will be visible by around midnight. Venus is fading away into the sunrise and might be visible in morning twilight,



Path of 2012 DA14 (picture credit: NASA)



Asteroid 243 Ida and its moon Dactyl (image credit: NASA)



A composite image of several asteroids (image credit: NASA)

but only at the beginning of the month.

Wishing you all clear skies and happy observing! ***

Scout Star Party at Mike's Jan 4

By Terri, Event Coordinator

Many thanks to Joanne Shen, who set up the Scouts to come to Mike's home for a star party on Jan 4. Joanne provided pizza & drink. We had about 25 Scouts & their parents (total), and in attendance from PAS was William with his 10" scope, Terri with an 8", Don had his 6", Darlene Ahlefeld brought her 4.5", John Miller had his 11" hooked up to a screen and was doing astrophotography, and Tim Jones attended with his new 8" go-to. The event was scheduled from 6:30 to 9pm. Set up and pizza was at 5:30 for the telescopes. Joanne sent 2 batches of pizza to Mike's home. The first batch was 3 pizzas for the PAS Volunteers. The second batch was about 10 more pizzas for the scouts & their parents. About 8:30pm, most of the scout families had left. Eric arrived about 9:15pm. The sky predictions was for 10 out of 10 seeing, so ERic didnt' want to miss out.

The most challenging part of the evening was the temperature. As the Scouts were leaving, it was 38 degrees. We were freezing! Many thanks to the PAS Members who braved the cold. Darlene, John & Tim all leave about 9:30pm, after all the scouts had left. So, Eric arrives, sets up, and around 1am, he is thinking it is too cold, and takes his scope back down. Don and I as-

sisted, as we had already packed up when he arrived, it was just too cold for me. Eric left about 1:30am. Don, William and I hung out with Mike until about 3am, and when we were leaving, the thermometer read 32 degrees. I was so cold that night. The highlights of the night were M52, Orion was absolutely gorgeous. I got to try my new christmas present of the 82A filter on Jupiter and I was very pleased. Also, with how good seeing was, the Nebula filter was doing an awesome job on anything nebula, except for the Rosette. John was photographing the Rosette during the night, and so Don and I decided to try our hand at finding it. We could find the asterism that is inside the Rosette, but in my scope, there was no Nebulosity. Don had a little, very little in his scope. And it was way too big to fit in my scope. I was super pleased with the viewing conditions, I just wish it was a bit warmer, by about 50 degrees! It was a very successful event at Mike's.

Joanne Shen writes: Hi Terri, Though the temperatures were brisk, the PAS team did a great job with our Cub Scouts. The Scouts particularly enjoyed Mike and the warmth of his cozy home and his meteorites. I learned so much too! Thank you for volunteering your time. Thank you for an

educational and special evening. Stay warm! Joanne Shen, Den 1 Cub leader, Pack 545 Cub Scouts

Darlene writes: Dark! COLD... bright Jupiter ... renamed Sirius Capella (oops, back to Astronomy 101) ... there HAS to be an easier way to find objects straight overhead ... great time with the scouts. Very knowledgeable. So were their parents.

Matt Petersen writes: I attended your stargazing event at Mike's house in Cave Creek last Friday and was requested to write a review of the event. I brought my youngest son who is a Webelos cub scout and also my oldest son who is a college student at NAU. Both of them enjoyed the presentation greatly as did I. The folks associated with your group are friendly and very knowledgeable about the sky and the objects they were viewing. Mike gave a great presentation on meteorites and the origins of the universe using the mineral samples he has. All in all, I give the evening a 10 out of 10! I didn't even mind the temperature and thought it added to the event. I will certainly be very interested in attending your future events. Thank you to all who were there. You made the evening very fun and informative. ***

Bookmans Jan 13

By Terri, Event Coordinator

A very chilly day it was. But, the weather was clear and we had a great time at Bookmans this month. In attendance from PAS were Don Boyd, Terri Finch, William Finch and Kevin Harcey. We had 1 RSVP, who did show up closer to 5pm (Jim). We had 2 sets of walk ins. Walk Ins is the reason Don & I hold the event, even if we don't have any RSVP's.

So, we got all set up and Rudy wanders in looking for us with his Meade ETX90. Don and William assist him and while they are helping Rudy, 4 young boys (Ben, Mathew, & Henry) & their parents, wander in to Bookmans wanting to know how to run a telescope. We set them up with some chairs, and then asked questions. For their class, these boys must view Jupiter and its moons, draw how they look and figure out which moon is which. And what they wanted help on was to learn how to use a GPS model of a telescope for which they not only didn't have with them, but wouldn't

have until that next Friday. We explained that GPS scopes are different from scope to scope, and that without having it in hand to work with, we couldn't advise the use of it. So, what we suggested instead, is that, they weren't required to set up the scope and use it, they were only required to draw Jupiter and its moons for the project. So, I told them about the Telescope workshop / Star Party at PVCC that next Thursday and invited them to do it there, Jan 17th. I also told them to download on their Android phone, the ap "Where is IO" so that they can know which moon is which at the time they were viewing it. We also discussed what to look for on Jupiter and how fast the moons travel around the planet. They were pleased with this info and departed.

Rudy, William & Don concluded their session as well. Then we had about 1/2 hour before Jim Mosely and his daughter Hayley showed up with their Celestron NNextar 4SE. What we concluded was that their

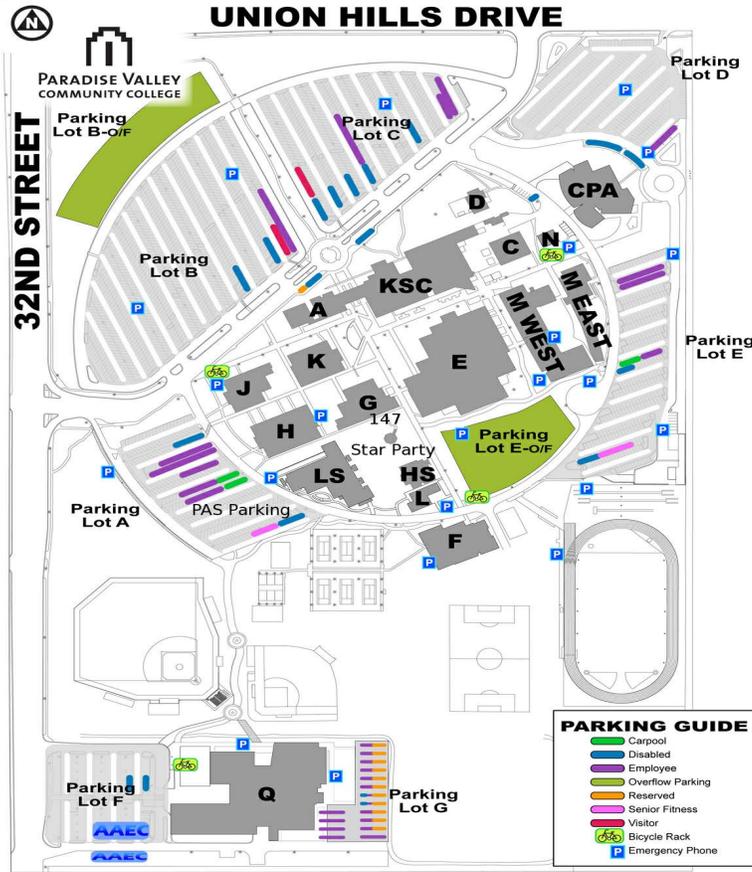
scope had been damaged in shipping, for which they had just received it for Christmas. We suggested calling Celestron to get a replacement. Jim left about 5:40pm and we packed up and departed. It was a very successful event. Thanks to Don and William for assisting with this event. Thanks to Kevin for keeping us company. The next Bookmans event is on Feb 10. Hope to have a huge RSVP list and some help from more PAS Members, if needed. ***



Terri & William Finch at Bookmans Telescope Workshop.

Map of PVCC Main Location

18401 N. 32nd Street | Phoenix, AZ 85032



Map of PVCC Black Mountain

34250 N. 60th Street | Scottsdale, AZ 85266



See page 2 for more details February 2013

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
					1	2
3	4	5 CTCA (Private)	6	7 PAS Meeting	8	9 Antenna's & Estrella Observatory Star Party
10 Bookmans Telescope workshop	11	12	13	14 BMC Public Star Party	15	16
17	18 President's Day	19 CTCA Backup date	20	21 Telescope Workshop	22	23
24	25	26	27 School (Private)	28 MOM tentative		

Don Boyd
 PAsTimes Editor
 3039 W. Peoria Ave 102-188
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To:

2013 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.

Mar 7: Melissa Morris "Which came first? The Chondrule or the Planet?"

Apr 4: Chet Schuler "Filters for use on Telescopes."

May 2: Paul Wieland "Space is not just a vacuum." ***

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What's Up For February

By Rod Sutter, PAS Past President

Name	Date	Rise	Set
Mercury	02-15-12	08:35	19:37
Venus	02-15-12	06:47	17:20
Mars	02-15-12	07:55	17:214
Jupiter	02-15-12	12:03	04:08
Saturn	02-15-12	23:54	10:52
Uranus	02-15-12	09:01	21:14
Neptune	02-15-12	07:31	28:36
Pluto	02-15-12	04:23	14:39

All Times Arizona Time

Planets in bold are visible during evening hours.

February 15 2012

Sunrise: 07:09

Sunset: 18:47



Q3: February 3



New: February 10



Q1: February 17



Full: February 25