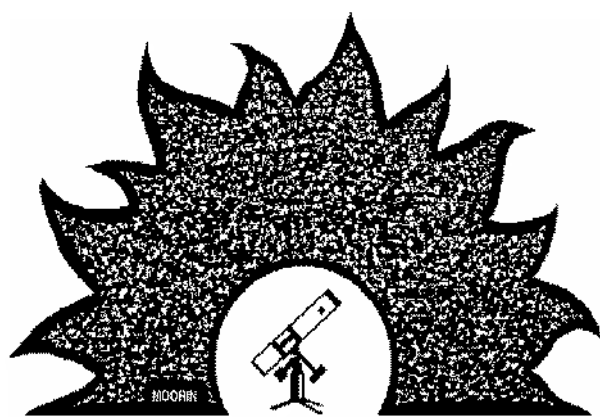




PAStimes

Phoenix Astronomical Society
www.pasaz.org

February 2012
Volume 63 Issue 6

PHOENIX ASTRONOMICAL SOCIETY — ESTABLISHED 1948

The Spectra of the Stars

By Chet Schuler

Chet Schuler is a current member of the Phoenix Astronomical Society. His college majors were Physics, Math, and Philosophy. His past accomplishments include: the invention and development of miniature power conversion technology for use in such projects as the first video color lunar



Photo by Terri.

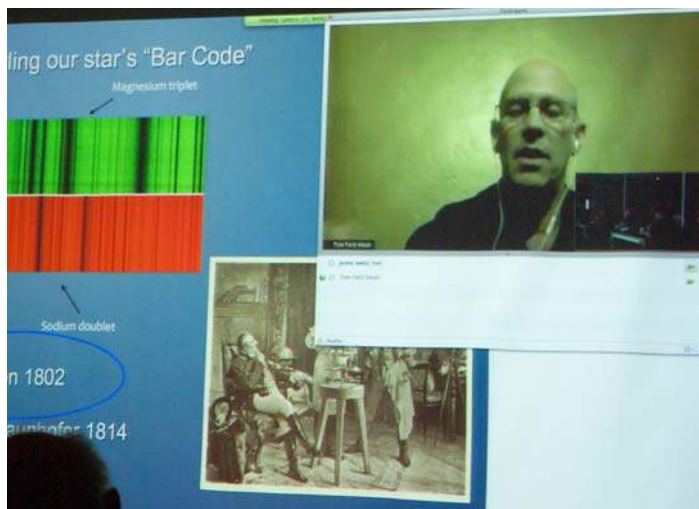
TV camera, the first teleprinter in space (Skylab), the Agena Inertial Navigation System, and the Viking (Mars Lander) seismometer. Co-inventor the first picture based computerized non-linear video/film editing system. It was called the Montage Picture Processor and became a major tool for the production of such weekly TV shows such as Star Trek. It subsequently received the first of Academy of Motion Picture Arts and Sciences Award given in in the editorial category for film editing systems since an award for the development of the Moviola in 1924. His most recent project was to design, develop, manufacture and market optical astrometric and RGB filters under the name of Schuler Astro-Imaging. That project was purchased and became part of Astrodon.

His Topic for the evening of Feb 2, 2012 is going to be “The Spectra of the Stars”. He will guide you through the necessary procedures required to acquire the data and to undo the distortion caused by the various obstacles such as our atmosphere and the non-linear character of our imaging and measuring devices to produce an accurate low resolution profile of the stars. This profile will then be compared to Theoretical Black Body radiation curves to discover a close approximation of the stellar surface temperature. All of these actions will be accomplished using imaging equipment and software that is easily available to all amateur astronomers. There is a lot more to observing the stars than the mere perception of those beautiful patterns that their pinpoints of light present to us in the night sky.
§

PAS Meeting Review Jan 5 2012

By Terri, Event Coordinator

The meeting opened with a quick “Welcome” from President Bruce & then we turned it over to our guest speaker for the evening. Tom Field did a presentation, via Webinar, entitled “Spectroscopy for Everyone.” It was a very interesting topic, well received by the audience, & very informative. After the meeting, I got a lot of feedback about the presentation. Many thanks goes to Tom for his awesome presentation. We did have some audio / visual discrepancies, but the audience didn’t seem to mind, so long as the info was good. Many thanks goes to Jenny Weitz, the PVCC Teacher who helped set



up the A/V for this evening’s presentation. She kept Tom in the screen & kept the computer awake & the camera on the computer, pointing at the audience for Tom to see while he did his talk. I counted Attendance at 27. A quote from the presentation, that I liked & thought I’d pass along, goes like this: “Speed costs money. How fast do you want to go?”

Tom completed his presentation, we reviewed some upcoming events. First I welcomed all the new faces, from which I cheated & used the sign-in sheet to find out who was who. Welcome to PAS these folks: John Miller, Bruce & Sherry Myers, Lou Roberts and John Pullis who have not been to many PAS meetings in

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Upcoming February PAS Events

By Terri, Event Coordinator,
Events@pasaz.org

Feb 2: PAS Meeting in the Library of PVCC Main Campus. Bring a Friend. Meet at 7pm, Meeting begins 7:30 with a few brief announcements & then Guest Speaker takes the floor. Meeting concludes & Library closes 9:30pm. Bring a snack to share. Water provided by our President.
<http://www.pasaz.org/forums/calendar.php?do=getinfo&e=643&day=2012-2-2&c=1>

Feb 9: FREE Telescope Workshop & Star Party at PVCC Main Campus in G-147 & by Telescope Dome, from 7pm to 10pm. PAS Members may use the 6" Dobs provided by PVCC for the Star Party. I do suggest PAS members bring their own eyepieces for better views. RSVP with Terri is required for the Telescope Workshop. When you RSVP, please include what type of scope you need assistance with & how many are in your party.
<http://www.pasaz.org/forums/calendar.php?do=getinfo&e=683&day=2012-2-9&c=1>

[?do=getinfo&e=683&day=2012-2-9&c=1](http://www.pasaz.org/forums/calendar.php?do=getinfo&e=683&day=2012-2-9&c=1)

Feb 12: FREE Telescope Workshop at Bookman's 19th Ave & Northern, 3:30pm to 5:30pm in Musical Instrument section of the store. RSVP is required. Please provide type of scope & number in your party, when you RSVP.
<http://www.pasaz.org/forums/calendar.php?do=getinfo&e=665&day=2012-2-12&c=1>

Feb 14: CTCA Private Star Party, PAStimes Star Tours Members Only.
<http://www.pasaz.org/forums/calendar.php?do=getinfo&e=749&day=2012-2-14&c=1>

Feb 16: School Star Party (Private) 5pm to 8pm. PAS Members Only. RSVP with Terri to assist.
<http://www.pasaz.org/forums/calendar.php?do=getinfo&e=762&day=2012-2-16>

Feb 23: Special PAS Meeting of the Minds with Guest Speaker. See article about this event in this issue entitled "SPECIAL MEETING FEB 23 WITH GUEST

SPEAKER." This is a Party, so bring a snack. Everyone Welcome! Meet in G-147 PVCC Main Campus 7pm to 10pm.
<http://www.pasaz.org/forums/calendar.php?do=getinfo&e=689&day=2012-2-23&c=1>

Feb 24: School Star Party 7:30 to 9:30. RSVP with Terri to assist. Telescopes are needed. More details can be found in the PAS Calendar and Forums:
<http://www.pasaz.org/forums/calendar.php?do=getinfo&e=716&day=2012-2-24&c=1>

Feb 28: Back up date for Feb 14 CTCA event.

<http://www.pasaz.org/forums/calendar.php?do=getinfo&e=750&day=2012-2-28&c=1>

Mar 1: Special PAS meeting at PVCC Main Campus in Q Building Rm 120A. Doors open 7pm. After a few brief announcements, Speaker takes over. Bring a snack to share. Water provided by our President.

<http://www.pasaz.org/forums/calendar.php?do=getinfo&e=643&day=2012-3-1&c=1>

ANTHEM SCHOOL STAR PARTY JAN 26

By Terri, Event Coordinator

It was a beautiful night for a star party. In attendance from PAS were Don Boyd with his 6" scope, Eric Steinberg with his 16" scope, William & Terri Finch with her 8" scope, Sam Insana with his 8" scope, Albert Tucker with his 6" scope, Mike Marron with his meteorites, and Bruce Wurst (with Bette & Ed Wurst) with his 20" scope. There were 200 expected in attendance, but I would believe we had closer to 300. This was open to the public, but I couldn't tell if this group belonged to the school or the public. Talley Seiglen was our contact at the school. We also met the Principal of the school, & a member of the PTA. We were thanked by just about everyone who came to view.

The highlights of the evening were, in order of appearance (now it sounds like movie credits) The Moon & Venus from 5pm to 6:45pm. Jupiter was seen around 7pm with Orion Nebula showing up around that same time. Dark wasn't until 7pm, so Q&A with the school kids didn't start until then. Photos of this event are in the PAS Photo Gallery on our site www.pasaz.org. The night progressed with a bunch of objects being viewed & shared.

As we arrived, pizza was already being shared. And of the 4 pizzas they provided, it was all gone by the end of the evening. Water bottles were provided, for which we were very thankful. Bruce & Eric stole the crowd, as they were the two largest scopes. Mike, of course, had a never ending supply

of people around his station. We positioned him on the other side of the cars, as to block his light from interfering with our viewing. It worked very well.

The evening went well. I believe it was about 6:30pm when the temperature dropped noticeably. Several of us scrambled to find our jackets. Then around 7:30 clouds showed up. First they stole the moon, then the clouds stole Orion Nebula, so I spent some time moving between objects just to keep something clear in the eyepiece. It wasn't a problem, just an annoyance. The people waiting to see through my scope were very patient & while I set up on the next object, we talked about Jupiter, the Moon, Venus's phases & Orion Nebula, depending on what they asked me. A group

Special Meeting Feb 23 with Guest Speaker

By Terri, Event Coordinator

Feb 23 PAS will be having a special meeting at PVCC in G-147 where by Leah Sapir will be doing a presentation entitled "A Tour of Internet Astronomy" Please join us for this meeting. Following her presentation, we will be having the Night Sky Network Awards Ceremony. 18 Nominees will be receiving Award Certificates and NSN Pins. How do you receive a pin? Show your

support for PAS by promoting Public Outreach through PAS events. The more active you are in the club (in any fashion), the more likely you are to become nominated to receive a pin. The Meeting of the Minds topics will be discussed as we close out the meeting around 10pm. It's a Party! Bring a snack to share. Water will be provided by the President. §



Ofelia Waters at PAS Social. Photo by Terri Finch.

"A Tour of Internet Astronomy" on Feb 23

by Leah Sapir

There's nothing like spending a night under a clear dark sky, observing galaxies, nebulas, stars and planets with a large telescope... but what can we do when the weather doesn't cooperate? What about weeknights, when we can't drive out of town to a dark sky site and spend the night there? What if you don't have a large telescope?

In recent years, numerous opportuni-

ties for long-distance astronomy have become available via the internet. For example, remote-control telescopes make it possible to view deep-sky objects on cloudy nights - and even in the daytime! Other innovations are also available via the web for astronomy enthusiasts. At the February "Meeting of the Minds", Leah Sapir will present "A Tour of Internet Astronomy". Join us at Paradise Valley Community College, Room G-147, at 7:00 pm on February

23, to explore some interesting ways to enjoy astronomy 24/7.

Leah Sapir has been a member of PAS since 1999. She enjoys viewing celestial objects through her 6-inch telescope (the largest size scope she can lift) when dark skies are available, and she enjoys astronomy through even larger telescopes via the internet at other times. She also likes to show sky objects to the public at PAS star parties. §

Cosmology & the Big Bang

Info provided by Dan Heim, Desert Foothills Astronomy Club

Wednesday, February 15th Guest speaker at DFAC will be Fr. William

Stoeger, S.J., from the Vatican Observatory. He will be talking about the latest research in cosmology. Meeting will start 6:30-6:45 pm, doors open at 6 pm. The

location will be the North Valley Regional Library in Classroom #2 in Anthem and the address is: 40404 North Gavilan Peak Parkway, Anthem AZ 85086. §

New Years Eve Party at Mike's Review 12/31

By Terri, Event Coordinator

It was a small group but it was a great party! It started out with everyone eating. We had Deviled Eggs & Chicken as the main dishes. The rest of the food items were desserts. Attending were: William & Terri Finch, Don Boyd, Ofelia Waters, Mike Maron (the Host of the party), Eric & Ora Steinberg, Sam, Vera & Frank Insana and Diane.

For the first hour or so we ate, chatted and were entertained by William Shatner singing / talking rock and roll songs. Mike's daughter had given him, for Christmas, a 2 CD set of these songs. So, all night long, we listened to them. Eric and Sam brought their scopes, so they were in and out of Mike's house, several times, viewing, in between other activities.

Sam & Eric brought their scopes for the Star Party. Skies were awesome!

Then we began the Night Sky Monop-

oly game. The competition was between Eric & Ora as a team, Mike and Ofelia as a Team, Vera, William, Terri, Don and we had Sam as the banker. As the night progressed, I was first to leave the game, losing everything. Following me was, Don then Ofelia and then William. That left Vera and Eric in the game. 5 hours later, Vera landsteps on a rather expensive property of Eric's and the winner is announced. Congratulations to Eric for first place and Vera took Second. When the game concluded, Eric & Ora departed.

By this time, it was close to midnight by about 20 minutes. So, we gathered our noise makers and went outside to enjoy the night and ring in the new year together. We had poppers supplied by Mike, and the old rattling metal noise makers, brought by Sam... and Hats. Photos were taken, and then we hung around outdoors, enjoying the clear night sky and the beautiful temperatures. It was a little chilly but with the right

jacket, it wasn't bad. We were out there just over an hour.

Then we came inside and Don decided he was leaving, announced it, and he, William and I attempted to leave. But William had gotten on Mike's computer and was showing photos of Mike's family, and since that had our attention, it was 2am before we actually started to get out the door; 2:45am before we left. We got home about 3:30, and in bed around 4am.

It was a fun party and many thanks to Mike for hosting it. There will not be a NY Eve party at Mike's this year, due to NY Eve falling on a Monday. We did it this year because the date fell on a Saturday, which made it nice for those of us who wanted to spend time with Mike, at his home, and enjoy the evening with PAS Members. HAPPY NEW YEAR PAS! Photos of this event are in the PAS Photo Gallery, now. Enjoy. §

PAS LISTSERV

By Terri, Event Coordinator

The PAS ListServ is available. If you haven't already gotten the email telling you how to access it, please read the rest of this article. PAS has 3 Lists.

We have the Officer's only list. If you are an officer, your pasaz.org email address has been added to the list, so that you receive the notices sent out by any officer, to the rest of the officers. When you are no longer a PAS officer, and your pasaz email changes over to another person taking that office, those emails will go to the new officer, automatically.

A second list was created for PAS Members only. For this list, you need to, as a PAS member, request being on the list. Don Boyd and Terri Finch are the moderators and will approve your membership into this list. We will also allow immediate family members to join this list. So, if you have a spouse or child 16 years or older wishing to be part of the list, they may request membership to the list. Here's how you join this list... list email: pasmembers@freelists.org. How to subscribe: Send email to pasmembers-request@freelists.org

phoenixastro@freelists.org Subject: subscribe (the moderator must approve their request).

A third list was created for anyone wanting to talk astronomy. That list info is... phoenixastro@freelists.org, phoenixastro-request@freelists.org. Subject: subscribe (requests will be automatically verified and added)

We hope to have the whole membership on the Member's Only list. What's cool about these lists is you can come and go as you please. If you don't want info from PAS, you can drop off the list at any time. Thank you for being part of PAS!§

Star Party at Kyrene Centennial Middle School Jan 10

By Eric Steinberg

Setup began at about 4:45 with viewing from 6:00pm to 8:00 pm. There is a new tarmac area near the sports field that made scope setup easy and stable. School staff members were incredibly helpful all around, including a buildings guy who took time to locate three long extension cords and get power to them. In attendance from PAS were Don Boyd with his 6" Newtonian, Eric Steinberg with the 16" Dob, and Mike Marron holding court in gym on (surprise) meteorites. There were also several scopes from EVAC, including a nice 20"

Astro-Systems Dob.

Seeing was excellent and afforded some really nice views of Jupiter, including a look through the 16" at 389X with lots of fine detail showing. The event was heavily attended by middle-schoolers, parents and siblings who were uniformly respectful and demonstratively appreciative of the views. Shown by this writer were: Jupiter, Venus, M31, M42, M37, the Double-Cluster and M79 (very faint in the skyglow).

Skies remained clear and temperatures were reasonably comfortable for this highly

successful event.

Thanks from Centennial Middle School

By Jon Hutman

I just wanted to say THANK YOU for your help with our third annual Family Space Night at CMS. We hosted 342 people and most of those went outside and viewed the stars, planets, and more. Mike did another fantastic job with his display, and in general everything was amazing. Thank you very much and thank you making our night a memorable one! ***

Bookmans Telescope Workshop Jan 8 Review

By Terri, Event Coordinator

We tried out our new location within Bookmans, in the Musical Instrument section. I think it gave us more room, but less ability to move around comfortably. We needed 12 chairs for all the folks joining us. The RSVP's were Chris Leftwich, who arrived later in the event with his C127 EQ, Katrina & Joshua Smith were there with their C102GT Nexstar, Nick, who didn't RSVP but also has a C102 GT Nexstar was there, Mike Brenner brought his Orion XT8 Dob and is seen in the PAS Photos as being helped by Eric Steinberg, Mandy H. Brought her daughter Rachael (10 yr old) and their Orion 70mm Refractor and Night Vision Binoculars for help. And we also had Marc Levinson (New PAS Member as of this event) who didn't RSVP but came to find out what type of scope to purchase.

Attending from PAS were Bruce Wurst, Ed & Bette Wurst, Eric & Ora Steinberg, William & Terri Finch, Rod & Sue Sutter, & Don Boyd. It started with William & I setting up the tables & chairs. I knew we

had 12 total and so I wanted to have at least 12 chair available in case everyone wanted to sit down to talk. As we were setting up Bruce & Don arrived & helped. Once set up, Marc arrived & we started to chat. Shortly after everyone else filtered in, except Chris, who arrive about ½ hour into the event. Everyone who attended to find out something about their scope or about purchasing a scope seemed pleased with the help they received.

This location seems promising. We also started out with a gentleman who sat himself down at the tables while we were setting up, and we started talking to him about astronomy, etc. I believe it was a great success. Many thanks goes to Bruce, who handled the C102 GT Nexstar owners. Eric helped with the Orion XT8 Dob. Don assisted with the Nexstar until Chris showed up with his C127 EQ scope. Rod assisted Mandy & Rachael with their Refractor & Binos. The Women of PAS, excluding me, went on a book search & came back with things to buy. It was a

great success, lots of fun, and hopefully we will see all these new people at future PAS events. The photos from this event are available to view right now. Enjoy. §



Eric Steinberg assisting Chris Leftwich with his Dob.

Telescope Workshop at PVCC Jan 19

By Terri, Event Coordinator

This was an amazing event. Jenny had done some extra advertising for us & created a nice collection of public, student & others to join us at this event. In attendance was Don Boyd, Tim Jones, Joe, Renee & Kat Collins, William & Terri Finch, Mike Marron, Jenny Weitz (PVCC) and Dave Hellman (PVCC). We had Marc Levison, a new PAS Member come to look through the scopes & to learn more about buying his first scope. I had 4 public RSVP's for this event with Marc as one, Matt Kim, Ron Lambert and Mike Lopez and all of them were there. 16+ other people also showed up, who were students or public! And we had a repeat attendance of Mandy & her

daughter Rachael with their scope. Alex Vrenios attended, new PAS Member and brought his C5. Don Boyd had his 6". Tim brought his 90mm. It was an awesome event. The scopes set up outdoors, and Mike, as usual, had a group around his meteorites all night long. No one showed up for the Telescope Workshop part of the event, but that was fine, as the crowd kept us very busy. During the event, Jenny, Don and I took a walk out to the Temporary Lot (that's the parking lot that closes at 10pm, that is closest to the Telescope Dome). And we talked about the Solar Eclipse event we are doing on the PVCC campus on June 5, 2012. It was decided, after the walk, & discussion of where the sun would be set-

ting, that we will need to move the event to the PVCC Black Mountain campus if we plan to see the sun, eclipsed, and setting. The building to the West of the Telescope Domes on the PVCC Main Campus is definitely right in the way and inconvenient. Before departing for the night, Jenny donated to PAS a Night Sky Decoder. Thank you Jenny for the donation. We will use it as a Door Prize at the PAS Social. Thanks to all who attended with telescopes & thanks to the many folk who attended the event. The weather was awesome up until 8:30 when the temperatures dropped drastically. That's when the scopes started packing up and the viewers departed. It was an awesome star party!

PAS-CTCA SkyTour Event Report January 17 2012

by Joe Collins, PAS member & CTCA Cancer-Fighter

Another successful event: It was a 3rd QTR moon (dark and clear) night - PERFECT for sky/star-gazing events like this! No solar viewing this time, but we had a total of fourteen caregivers & patient guests this evening between 7pm and 10:30pm. We had three different types of scopes available for the CTCA guests to view through: A huge 16" Dobsonian brought out by Eric and Ora Steinberg, a 6" Newtonian reflector brought out by Don Boyd and a Celestron 11" Schmidt-Cassegrainian brought out by Joe Collins.

There was a champagne & hors d'oeuvres social for CTCA stakeholders at the 5th floor garden Terrace (our usual venue) that finished up around 6:30pm, just short of our event start time. While most of us were at dinner, Steve Palmer went up to check on the scopes setup and had an opportunity to talk with several CTCA board directors; he answered their questions and explained about the scopes & what PAS does for CTCA. They expressed their deep appreciation towards PAS. Steve invited them to stay after their event to view through the scopes, but they already had plans for a dinner meeting. Still, we had a moderate turn-out and refreshments [Hot chocolate, Coffee, water, cookies] available under the stars. Here is a short summary of what was seen tonight, and what we experienced, 'in the words of our attending PAS

members':

Eric & Ora Steinberg (eric@ytdept.com): I viewed the following items last night: M35, M36, M37 – looked great. Customers really liked it; M38, M42 – at various magnifications. Excellent viewing @ 389X with six stars clearly resolved in the Trapezium, M44, M52, M79 – pretty washed out in sky glow, Double Cluster, Jupiter – Lots of detail @ 389X (seeing better than predicted) and Venus. We had 10-12 people overall.

Don Boyd (azphotog@gmail.com): I viewed the Andromeda Galaxy M31, M44 the Beehive, M45 the Pleiades, Jupiter, Venus, The Double Cluster Caldwell 14, and the ET Cluster Caldwell 13. The atmosphere was so clear and non-turbulent, I was able to use my new Meade 5000 HD-60 6mm eyepiece from Amazon.com tonight. Initially, I had a little problem with my scope doing a GoTo to an object, but I discovered my date setting was for 2011. The GoTo worked well after the second alignment with the year corrected.

Joe Collins (jcollins79@cox.net): I showed our guests: Venus, multiple stars: Polaris, Sirius; the double cluster in Perseus (Caldwell 14), the Praesepe/Beehive Cluster (M44); Jupiter and its moons: Io, Europa, Ganymede, Callisto. M31 was not spectacular, but a few guests gasped at the sights of the stars of Orion and the Orion Nebulae (M42 Trapezium/M43) which,

along with Jupiter, I showed several times throughout the night. The sky was so clear tonight, the nebulae wisps of M42 were vivid and larger than I have ever seen here before at CTCA- not bad for an inner-city location! As in previous months, I shared the iPad 'StarWalk', 'StarMap', and 'Gas Giants' apps to show folks how the objects we were viewing look like from the Hubble and Spitzer space telescopes and to check facts on object size and distance and unique characteristics. I showed two customers M45 using 12X50 binoculars. There was much curiosity and questions about the moons of Jupiter. I was ready to breakdown the event at 9:45pm, but had a few extra patients (bringing the customer total up to 14 for me) come up late, so I stayed until 10:30pm-by that time it was chilly, but the darkness and cloud-free viewing was worth it!

I want to thank Don, Eric & Ora (their first time event at CTCA), and Steve Palmer (sapalmer_98@yahoo.com) for volunteering- even though Steve came later and did not bring a scope (as we didn't need another one), he was still very helpful and we appreciate his camaraderie. On the CTCA side, we are thankful to Marisa of marketing for providing the meal tickets and color copies of our handouts and the hospitality workers for providing the refreshments for event guests. We are looking forward to more winter sky viewing when we return on Valentine's Day February 14. §

PAS Social Jan 21

By Terri, Event Coordinator

Did you miss the Social this year? I'm sorry... you missed a great party! It was held at Mike's home in Carefree, this year. The set up committee arrived a little later than expected, but we got things going by the time the first guest arrived. 4pm was the start of the event and keeping everyone out of the food until 5pm was a challenge. We had a great spread of food this year: Buffalo Wings from Barro's Pizza, Roasted Chicken, Fried Apples, Deviled Eggs, Chocolate Peanut Butter Candy, Peanut Butter Rice Krispie Treats, VERY HOT Cream Cheese Dip with chips, several Rotisserie Chickens, Cream Cheese Wraps, a Meat & Cheese Plate, Chicken pasta and Beef Pasta, Spinach Salad, Hot dog Stew, Apple Pie, Brownies, a Mexican Food dish, Spaghetti, Potato Salad, a Fruit Tray. It was all good eating! Thanks to everyone who brought such a variety. A case of water was provided by Bruce, our President, and ice in a cooler was provided by Mike.

In attendance was: Linda Weiler, Jerry Belcher, Tim Besch, Don Boyd, Joe, Renee & Kat Collins, William & Terri Finch, Kevin Harcey, Matt Kohl, Marc & Donna Levison, Mike Marron, Bruce Myers, Bob Senzer, Diane Smith, Eric & Ora Steinberg, Albert Tucker, Ofelia Waters, Judy Wolff, Bette, Ed & Bruce Wurst, Donna Zander, Dewell & Wendy Howell. The Social is a great way to meet the spouses of active members, who you do not get to meet at events!

The evening continued after dinner as we tried to set up the Dart game, however, there was a storm, a freezing cold breeze, & slight drizzle of rain coming down around 6:30, so at that time we canceled the dart game. I took pictures of the Dart Trophies for which Jerry said we should have another event at Mike's that has a potluck, possibly a star party and the dart game, so we can win the trophies. Jerry brought 2 trophies: a 1st & 2nd place trophy. If we don't use the trophies this year, Jerry also said he would change the plaques to read 2013 for next year's event. The trophies this year are awesome. Check the photos in the PAS Photo Gallery in a week or two, when I get them posted.

So, then Sam suggested an indoor game of miniature golf, he called the Putting Game. Luckily he had it in his car, & so we gathered around for this game. Sam ran the game but also played with us. Sam

scored & caught the balls. Ed put the balls back in place for the next shooter. Bruce helped a bit with that as well. The players were Bruce W., Ed, Bette, Ora, Eric, Albert, Diane, Sam, Judy, Bruce M., Mike, Terri, William, Kat, Marc, Ofelia, Bob, & Joe. The rest of the folks sat around & talked while we played for a prize. How we played... 3 rounds, best total out of three rounds wins. Each round was 3 balls, for a total of 12 balls in the game per person. Ed Wurst took First place with a score of 4 out of 12 & Judy Wolff took 2nd place with a score of 3 out of 12. This wasn't an easy game. The carpeting kept making the golf balls drift all different directions. It was great fun. Thank you Sam, for bringing along this game.

While the Putting game was going on, some people worked on the Tetris puzzle I brought, while others played the Base Ball game Ed brought. There was much chanting like "Don-na, Don-na," etc... as she took her shot. And many photos were taken of this event.

Then it was time to play the White Dwarf Gift Exchange. I had asked that anyone not playing the game, bring a camera to take tons of photos for me of everything. Marc & Don were my photographers. I caught some photos, but I was mostly running the event. The game was great. Lots of laughing, & I didn't have to ring the bell to end a stealing frenzy. I did have to ring it to settle the chatter down to announce the next player's number. Here are the prizes that were won at this year's game: Jerry won a DVD and 2 books: Apollo 18, Impact & Space Tourists Handbook. Joe got a Celestron First Telescope, Kat got a book called Orbit, Renee got a Blue Ray DVD "History of Missions." Terri got a Gift Certificate to Starizona of \$30, William won an eyepiece case, Kevin got a Laser Pointer, some Meteorites, a 3 eyed monster from Toy Story that connects to his cell phone to let you know a call is coming in, and a book called "Home Planet." Sam got Night Sky Book & a deck of Constellation Cards that go with it. Matt got a Darth Vader mug and a book about Astronomy which he later passed on to Kat. Mike got "Rocket Men," book & "Cosmic Tour," book. Bruce M got a DVD "Universe" & Moon in my Room. Diane got a Pocket Plasma Disc & a book. Albert got Hangar 18 DVD. Ofelia got a biography of Albert Einstein. Judy got a 6.4mm eyepiece. Bette got an Astronaut Pen & a Sat-

urn Puzzle. Bruce got a metal Detector, an eyepiece and a 2012 Astronomical Calendar. Ed got a Stargaze BluRay DVD. Donna Z. got an MP3 player, a Card Reader and the speakers to hear the MP3 player. Dewell got a "3D Universe" Blue Ray DVD. Wendy got a computer program "Starry Night Pro." It was a great game with lots of laughing & fun fighting for gifts. Thanks to all who participated & made this game fun.

Then we awarded the Door Prizes. There were 7 prizes brought to this event. I wish to thank Mike for donating 1 door prize, and Jerry for donating 2 door prizes. I brought 4 with me, 2 were donated by Ed. The other two were donated as follows: Paul Schmidtke of ASU West donated a book in appreciation of the assistance PAS members have given to his ASU West Open House events. Along with the book was a card that reads: "Dear PAS Members. Please accept this small token of my appreciation for ALL that you have done to help make the ASU Astronomy nights a big success! Thank you, Paul Schmidtke." It was a book called "Universe" & Bob Senzer won it. The other Door prize was donated to us by Jenny Weitz & Dave Hellman of PVCC. It was a Bushnell Starwatcher's Decoder Kit & was won by Judy. Here's how the Door prizes were awarded. The first Door Prize drawn is always the Door Prize given for attendance. William won the main door prize and chose the multimeter. Then for the Putting Game, we awarded 2 prizes. Ed got a tin of "Double Crisp Coal - Being Naughty Never Tasted so Nice," which was chocolate candy, donated by Mike. Judy who took 2nd place got the Starwatcher's Decoder Kit. Then we did the rest of the Door prizes as who was drawn. Ora took the first one and got a multimeter. Then Ofelia took the second door prize and got a tape measure. The third door prize was won by Bob and he took the "Universe" book, and the 4th prize was won by Joe, and he took a multimeter. As we were concluding the party, applause was given to Mike for hosting the event. And applause was given to Terri for running the party. Many thanks goes to all the attendees, and to Mike for rearranging his entire house to accommodate this party. It was a great success, even with the cold, nasty weather outdoors. Upon packing up and leaving at 2am, several of us stepped outdoors, into the very chilly night, & viewed super clear skies & awesome bright stars! Those that stayed

Continued on page 10

Anthem School Star Party Jan 26

wanted me to put my scope on Venus, so while I found Venus I explained about the phases, however, Venus was rather dull this evening. A super bright light with hardly any visible phase. In Bruce's 20" you could see more of a phase, but it was just so bright & I dimmed it with the Moon filter thinking that would help. What it did was cause questions about why Venus is green. When the Moon filter is on the Moon, & it is green, we can say the Moon is made of Green Cheese, but on Venus, I had no funny thing to say about it, so I explained why I put the filter on Venus.

Sam writes: "I showed sunspots with one scope and solar flares with another scope, then I showed the moon, Jupiter, Orion Nebula, and Gamma Andromeda double star. One adult lady noticed the earth was moving because objects were moving a little in the telescope, that I hadn't been able to polar align because of the clouds. She asked what direction the earth was moving. I asked her little 6 year old girl if she could figure out which way the earth was turning. She then said "The moon is going down to the West, so the Earth must be turning to the East." I told her she was

absolutely correct. Also, another adult said he was raised in La Puebla (a town near where Frank is doing his animal & plant analysis in Mexico). He said he studied at a fine observatory near the town. I therefore emailed Frank & I hope he gets a chance to check it out. Sam"

Don writes: "I showed the Perseus double cluster, the Pleiades, the Moon, and Venus...I tried for ET but I think the clouds were moving in as all I saw was the 2 bright eyes."

Eric writes: "I Showed the moon at 203X, Jupiter at same and M42 at 130X to lots of people before it pretty much clouded up. I think the folks really enjoyed it. Eric"

What was nice about this event is it started with the kids in the school auditorium, going from station to station, to learn more about space. Several groups were set up inside the Auditorium: ASU Astro Club, folks from Civil Air Patrol, Honeywell was there, Navy Communications Satellite Program, & Boulder Creek Engineering / Robotics, MAD Science. We didn't get to experience much of the indoor activities (none to be correct), but when Talley came out to check on us at the end of the event,

she told us about the inside part of it. And I want to thank Talley & the school for including PAS in the event, & for mentioning us in their handout. They made a little booklet that showed where on the school grounds the events were occurring, & listed PAS for the event. The event was set up so that the indoor portion was from 5pm to 6:30, although we had quite a few who stopped by to Solar View, & then from 6:30 to 8 was night time viewing through the telescopes. We were busy the whole time. There wasn't much of a break at any point during the night. It was awesome!

I wish to thank Talley for inviting us. We definitely will want to do this event again. The viewing area was perfect for the amount of scopes we had, & the lights around the school were great, not too bright. However, the park to the West of the school, had flood lights on the whole time we were there. We hope to have those NOT on for next event. They want us to return. Many thanks to Eric, Don, Albert, Bruce, Sam & Mike for doing this event with me. I think we had just enough scopes for the number of attendees.

CTCA - PAS SkyTour Event Dec 20th

By Joe Collins, CancerFighter, PAS member

We had ten attendees for this event: four patients, three caregivers, and three CTCA employees. Maria of the hospitality crew, brought up cookies and HOT chocolate around 7pm which was gratefully welcomed because (despite no chilly wind), it was still COLD this evening. We ran from 6pm to 8pm, but got socked in with clouds until about 7:30pm. Still, we were able to share stunning views of Jupiter and the Gallilean moons, and Venus [before Venus

set]. We shared information with guests about the sky and the 'Star of Bethlehem' (handouts) and showed what the Galilean moons looked like with the 'Gas Giants' and 'Jupiter Atlas' iPad apps. Around 7:30pm, the sky cleared up beautifully, so Don Boyd and I stayed until 9:30pm to show off some binary stars, the double double cluster, and M42 Orion Nebula. We also were able to see the "occultation" of Io - one minute it was brightly shining to the west of Jupiter,

and the next moment it was 'gone' (behind Jupiter). About 9pm we were serenaded by a chorus of coyotes & their kits! Even though this was the 'back-up date', thanks to Marisa and Concierge, we had plenty of advertising for this event. I just think our attendance was lower than usual because of the cold and the cloudiness the first hour and a half. We are hoping for clearer skies in January to be able to show guests more objects. §

PAS Meeting Rev Jan 5 2012

Continued from page 1

the 2011 year. Welcome back! And then we had some new faces: Alex and Tim, Ofilia (Mike's Girlfriend), and Millard. Welcome new faces to PAS! Then we reviewed these upcoming events: Bookmans Telescope Workshop on Sunday Jan 8, & Centennial Middle School star party on Tues Jan 10th, plus the PAS Social on Jan 21 at Mike's home. Mike handed out maps to his event. When talking about the PAS Social, we listed a few things we have planned & some things we need. We could use dart boards,

spotlights for the dart boards, your telescope as it is a Star Party, & don't forget to get a White Dwarf Gift if you are in on the hilarious game with us. CTCA is hiring PAS again in 2012, so watch for those events & sign up on the site to help out. The February PAS Meeting is in the Library, but we have a special PAS meeting, with guest speaker, Leah Sapir, in G-147 to start off the Meeting of the Minds on Feb 23rd. Many thanks to all who brought snacks, we had quite a collection. Sam brought pop-

corn, Ed brought many cookies & cake, Sherry brought my favorite Brownies! Sherry Myers won the 50/50 raffle. \$34 was divided between Sherry & PAS. Sam reported on an error in the new calendars we purchased from Jerry. He has the reprint, so contact Sam Insana for a copy of the updated moon chart from page 37. The one in the book is 2011. It was an awesome meeting with a fantastic guest speaker & was well enjoyed! Photos of this meeting are in the PAS Photo Gallery now. §

Arizona Sky



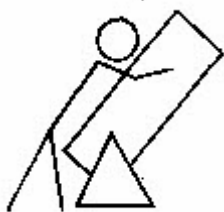
By Leah Sapir

The constellation Gemini, northeast of Orion, is prominent in our February sky. It's easy to find: a line going from Rigel through Betelgeuse points towards the "twin" stars, Castor and Pollux. (Rigel is the bright white star at the bottom right of Orion's hourglass shape - Orion's "knee"; Betelgeuse is the bright reddish star at the top left - Orion's "shoulder".)

But Castor and Pollux must be fraternal twins, since the two stars are very different in character. Castor, the one on the right, is really a multiple star. Its two main components, separated by a few arc seconds, can be seen through a good telescope. They are actually about 100 AU apart (about 9 billion miles, or 1/600th of a light year) and take about 400 years to complete one revolution around each other. But if two stars aren't enough, it turns out that each of these components - Castor A and Castor B - is a spectroscopic double, i.e. a double star where the components are so close that we can only tell from the star's spectrum that there is more than one. Castor A and Castor B are each composed of a large type-A white star having about twice the mass of the Sun, and a much-smaller red dwarf with about half a solar mass. Each red dwarf star is only a few million miles from its brighter companion (.12 and .03 AU, respectively). The stars in each pair orbit each other every few days (9 days for Castor A and 3 days for Castor B).

These two sets of twins are orbited by a fainter, more distant pair: Castor C, about one arc-minute from the main pair, is a spectroscopic double composed of two red dwarfs, each with a mass of about 0.6 solar masses. These two faint stars are only about 3 million miles apart (4 solar diameters, or about 1/25th AU). They orbit each other once every 20 hours, eclipsing each other as they do, making Castor C a variable star. Castor C is separated from Castor A and B by about 1000 AU (1/60th of a light year), and takes about 14,000 years to complete an orbit around the main pair.

Castor is a bit fainter than Pollux, but it is also farther away: about 51 light years, compared to 34 light years for Pollux. Pollux is an orange type-

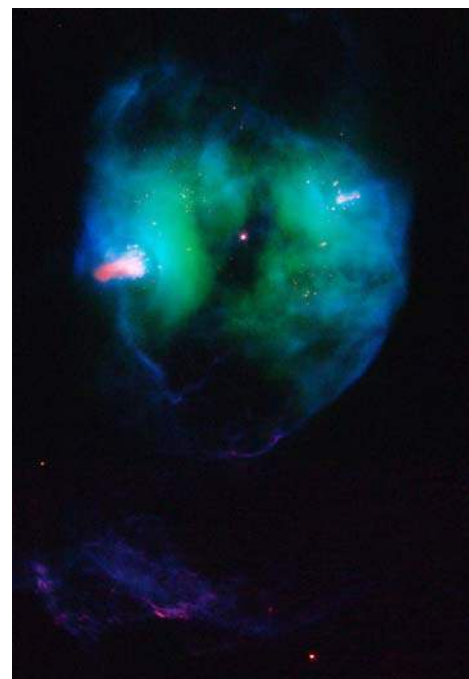


Gemini Nebula (NGC 2371-2372), imaged by Tony

K giant which has converted most of the hydrogen in its core to helium, and is now fusing the helium into carbon and oxygen. It has about twice the mass of the Sun, and about 50 times the Sun's luminosity. Its diameter is about 10 times as wide as the Sun - about 9 million miles, or 1/10th AU.

Pollux doesn't appear to have a companion star, but it's not all alone in the world. It has a planet with about 3 times the mass of Jupiter, that orbits the star at about 1.7 AU (slightly farther than Mars is from the Sun). The planet takes about a year and a half to orbit Pollux. But since Pollux is much larger than our Sun, the planet receives about 16 times as much radiation as we do, and the angular diameter of Pollux as seen from its planet would be about 6 times the apparent diameter of the Sun in our sky.

A little below the "twin" stars - about 3 degrees southwest of Castor, and 4 degrees west of Pollux - is a "twin" nebula. At least, that was the impression that William Herschel got when he discovered it in 1785 and reported it as a "small, bright double nebula". Each part of the "double" nebula received its own NGC number: NGC 2371 and 2372. Today we realize that they are just two parts of one object: the



NGC 2371-2372, imaged by the Hubble Space Telescope

two bright lobes of a planetary nebula, the last stage in a star's lifetime. After the red-giant stage, the outer layers of the star expand, and are ionized and illuminated by ultraviolet light from the star's core. The central star of this nebula is a Wolf-Rayet

Arizona Sky

star, a very hot star that is actively expelling its mass in a strong solar wind. The surface temperature of this one is about 130,000 K. The high temperature is due, in part, to the fact that we are now looking at the star's core. (By comparison, the Sun's surface temperature is about 6000 K, but its core is about 16 million K.)

An ordinary astrophoto of NGC 2371-2372 shows two fuzzy blue lobes with a bluish star between them, but a photo from the Hubble Space Telescope shows a lot more detail: faint outer lobes, and pinkish spots of cooler, denser material. The distribution of these spots indicates that there might be a companion star orbiting the central star of the nebula. The Hubble photo is not an exact representation of the nebula's color. It uses different colors to show light emitted from various elements: red for sulfur and nitrogen, green for hydrogen, and blue for oxygen.

NGC 2371-2372, also known as the "Gemini Nebula", is about 4000 light years away. The central lobes are about one light year in diameter, but the outer lobes seen in the Hubble photo are about twice that distance from the central star.

Near Eta Geminorum, the "foot" of Castor's figure in the constellation, is a "twin" star cluster. It's about halfway between Pollux and Bellatrix (the bright star at the top right of Orion, representing Orion's other shoulder). In this case, the two clusters are actually quite similar, but their appearance differs due to distance. The brighter cluster, M35, is easily found in a telescope. It was originally discovered by Giovanni Hodierna, a contemporary of Galileo, in the 1600's, using a small refractor that magnified only 20 times. Although Hodierna published his observations in 1654, his work was not widely known. Therefore, astronomers were not aware of the previous discovery when Jean Phillippe Loys de Cheseaux found the cluster about a century later, in 1745. Charles Messier added it to his list as M35.

About half a degree southwest of M35 is a fainter, more compact cluster, visible in an astrophoto or a large telescope. This is NGC 2158, discovered by William Herschel in 1784. Although the two clusters do not visibly resemble each other, they are actually similar in size, both being about 20 light years in diameter. NGC 2158 appears fainter and denser because it is 16,000 light



Open clusters M35 (large cluster at center) and NGC 2158 (small fuzzy spot at bottom right), imaged on www.slooh.com

years away, compared to "just" 3000 light years for M35. NGC 2158 is also a lot older: it is estimated to be about a billion years old, compared to 200 million years for M35.

In the meantime, back in the solar system, we've got some really great planets coming up this month!

Venus is putting on a great show in the western sky after sunset. This month it will be up till 9 pm or even later, shining like a beacon. And Mercury will be joining Venus as an evening star in the second half of February. The best time to see Mercury will be the last week of February and first week of March, when the elusive planet will be up till 7:30 pm or even later.

Jupiter will be high in the western sky after sunset all month, setting around 11 pm. The three planets will be in almost a straight line, so if you have difficulty finding Mercury, just imagine a line from Jupiter through Venus, and follow it down close to the horizon to locate Mercury.

As an extra treat, the crescent Moon will be making an appearance next to each planet: on February 22 near Mercury, on February 25 near Venus, and on February 26 near Jupiter.

Uranus is also an evening star this

month, but requires a telescope. It will appear close to Venus on February 8, and close to Mercury on March 4. Neptune sets too early to be visible.

In the meantime, Mars and Saturn are coming up in our eastern sky! Mars already rises at 9 pm at the beginning of February, and by 6:30 towards the end of the month. And this means that Mars is moving towards opposition, when it will be up all night from sunset to sunrise. Opposition is the time when Mars is largest and most visible. Mars begins February with a diameter of 12 arc seconds and a distance of 73 million miles; and in the first week of March it will reach a diameter of 14 arc seconds and a distance of 60 million miles – not the closest conjunction, to be sure, but certainly enough to justify exploring this interesting planet with a telescope.

Saturn rises a bit later – midnight at the beginning of February, and 10 pm towards the end of the month. The full Moon will appear close to Mars on February 9-10, and near Saturn in the wee hours of February 12 and 13.

Moon phases for February are: full Moon on February 7, third quarter on February 14, new Moon on February 21 and first quarter on February 29. ***

PAS Social Jan 21

Continued from page 6

behind until 2am were Ofelia, Mike, Bob, William, Terri, and Don. Everyone else left shortly after the party concluded.

Let's start planning for next year's event. Find your Astronomy White Dwarf Game present early & be ready for another

fun event. Watch for updates about the dart game. We may have it before 2012 ends... if I can fit it in the schedule.



*Ora Steinberg playing Putting Game.
Photo by Terri Finch.*



Food & Friends. A great way to spend a Saturday evening.



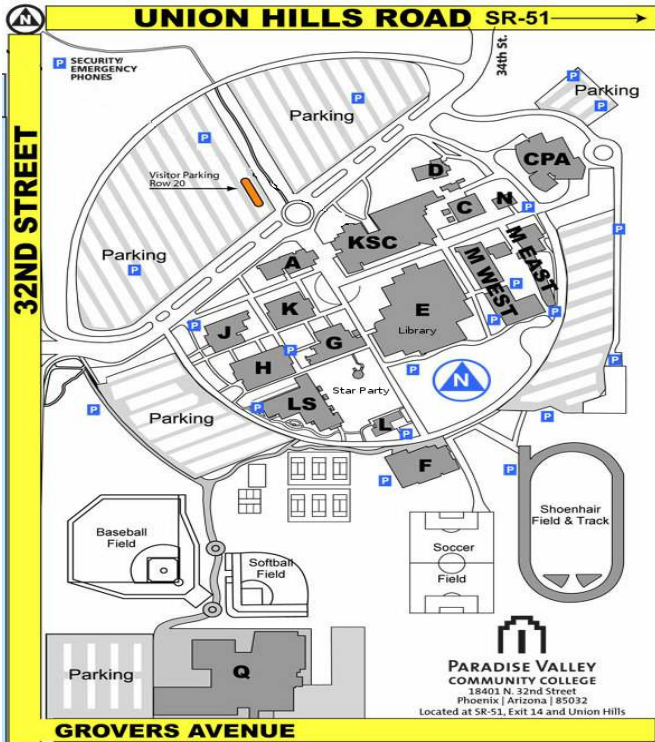
(From L to R) Donna Zander, Bruce Wurst, Terri Finch, Ed Wurst playing the White Dwarf Gift Exchange Game.



Terri Finch & her "fought for" White Dwarf Gift.

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 information

February

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
			1	2 PAS Meeting, PVCC Library	3	4
5	6	7	8	9 Telescope Workshop & Star Party at PVCC	10	11
12 Telescope Workshop at Bookmans	13	14 CTCA Private Star Party	15	16 School Star Party (Private)	17	18
19	20 President's Day	21	22	23 Special Meeting of the Minds	24 School Star Party (Private)	25
26	27	28 BU date for CTCA	29			

Don Boyd
PAStimes Editor
701 W. Del Rio St.
Chandler AZ 85225

To:

PAS Guest Speaker Line-up for 2012

By Terri, Event Coordinator, Events@pasaz.org

Do you have an idea for a Guest Speaker?

Feb 23 in G-147: Leah Sapir "A Tour of Internet Astronomy" & NSN Awards Ceremony

Mar 1 in Q Building Rm 120A: William K Hartmann "Origin of the Moon" Book sale & signing

Apr 5: Rick Tejera "Astrophotography"

May 3 in G-147, Pizza Party: Rogier Windhorst "New Cosmos with the new Hubble, & James Webb Space Telescope"

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What's Up For February?

By Rod Sutter, PAS Past President

Name	Date	Rise	Set
Mercury	02-15-11	07:35	18:39
Venus	02-15-11	09:06	21:27
Mars	02-15-11	19:46	10:38
Jupiter	02-15-11	10:21	23:26
Saturn	02-15-11	22:55	10:14
Uranus	02-15-11	08:53	21:00
Neptune	02-15-11	07:21	28:23
Pluto	02-15-11	04:10	14:32

All Times Arizona Time

February 15 2011

Sunrise: 07:07

Sunset: 18:08



Q1: January 31



Full: February 7



Q3: February 14



New: February 21