

# PAStimes

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PHOENIX ASTRONOMICAL SOCIETY — ESTABLISHED 1948

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## Ken Herkenhoff To Be December 3 Speaker

Ken Herkenhoff of the U. S. Geological Survey Astrogeology Team, Flagstaff AZ will be speaking on "CCD Imaging from the Mars Explorer Rover".

Herkenhoff gave us the following intro to his upcoming presentation: "The Mars Exploration Rovers (MER) have explored Mars for almost 6 years since they landed in January 2004. The Athena science payload on MER includes the Microscopic Imager (MI), which has returned thousands of images of Mars with

higher resolution than any previous camera system. Designed to simulate a geologist's hand lens, the MI is mounted on the instrument arm and can resolve objects 0.1 mm in size or larger. Analysis of MI and other Athena data has yielded new scientific results and demonstrated the value of complementary instrumentation on vehicles with significant mobility".

As is mentioned in another article in this newsletter the meeting location is changing from the Library to Room G147.

Also the speaker will be starting his lecture at 7:30. With announcements after the lecture.

The December meeting is also a swap meet so bring your astro-related items that you wish to sell. If you wish to bring a snack to share, please do. Don't forget the Magazine Sale! Read about it in this issue.

We hope to see a good crowd for the first meeting in Room G147.

## November 5 PAS Meeting Review

By Terri, Event Coordinator

Photos can be found:

[http://www.pasaz.org/forums/gallery.php?g2\\_itemId=4918](http://www.pasaz.org/forums/gallery.php?g2_itemId=4918)

The meeting was awesome! We have a fantastic guest speaker who shared his experiences with his Remote Telescope Astrophotography. This is VERY related to what Chris has set up with his 2 telescopes in Mayer at the Cuttin' Edge Observatory. We listened as Dean Salman presented to PAS how he works his telescope remotely & gathers images of deep space objects without having to leave his home.

The meeting adjourned early. But before departing... please note that it was decided that ALL FUTURE PAS meetings are being held in G-147.

There were many handouts at the meeting. The snacks were awesome! Thanks goes to the Wurst's for bringing the case of water. Many thanks goes to Sam for providing the popcorn. I brought some more of the cookies that Bob Senzer had provided previously. I love individually

wrapped items. I can bring 2 rolls of cookies, and have no left overs.

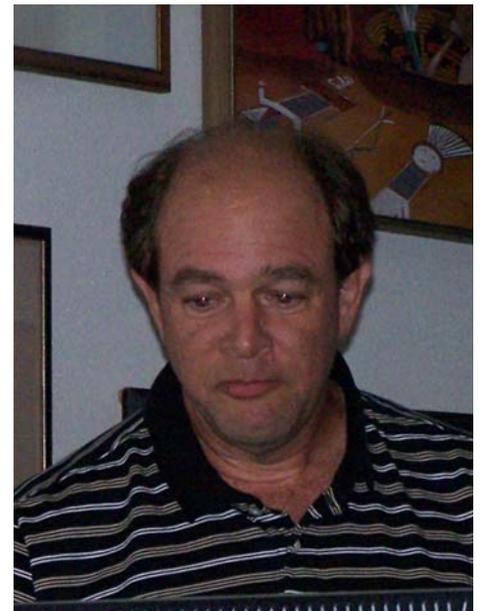
At the meeting, I also collected for the Year IN Space calendars. If you missed your chance, you can order one yourself and pay \$12 plus shipping. This is why a calendar at \$11 or \$10 is better ordered as a group... there is no shipping.

We didn't have the 50/50 raffle this month. I forgot the box that has those items in it. So, everyone can save up their cash and go double in December? J/K.

Dave announced that one of the teachers at PVCC in the science dept has had surgery. PAS will provide a card for this teacher for which we will be signing at the December PAS meeting. Dave can then deliver it to Jerry. Come sign the card for Jerry at the meeting.

And Steve Palmer provided us with a special code to get 5% off your order and free shipping at optics planet website using the following code: BX55M9N. PAS Members may enjoy this savings.

Thanks to everyone who attended the meeting. Thanks to DEAN for an awesome presentation. We hope to see everyone at the December PAS meeting!!! \*\*\*



Dean Salman

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## Upcoming December 2009 PAS Events

By Terri, Event Coordinator

**Dec 3:** PAS meeting. NEW MEETING LOCATION – G-147 for all future PAS meetings, until further notice. We have an awesome speaker lined up and coming to us from Flagstaff. We have the PAS Swap Meet, and a major MAGAZINE SALE. Bring magazines to donate to PAS for the purpose of the sale. Sale will be 5 cents a piece, or what ever you wish to donate towards PAS for the magazines you'd like to take home with you. All magazines having anything astronomy related in them are welcome at this sale. The guest speaker will begin promptly at 7:30, as he would like to be able to drive home by 9pm. Since we are in G-147, we do not have to vacate the room until 10pm, however, the meeting will adjourn around 9:30 to allow time for last minute sales of the Swap Meet and the Magazines, and for some socializing. See you there!

**Dec 10:** PAS Telescope Training Workshop. This is a FREE workshop, open to the public, in which we need volunteers to attend to help out. RSVP is required for NON PAS members. We are holding it in G-147. A star party will be happening outdoors that same evening. The plan is to show the newbies how to use their scope indoors (G-147), then help them outdoors in the darker areas by the

telescope dome, to learn to use their scope by night. Start time is as close to 7pm as possible – getting into the room. End is 10pm. Invite everyone you know who needs to learn how to use their scope. Handouts will be available. No lecture is scheduled for this event, this time. If this works out well, we will schedule several workshops for the Spring semester. Watch for announcements. RSVP is with Terri for this event. More info can be found in this Forum Thread: <http://www.pasaz.org/forums/showthread.php?t=357>.

**Dec 11:** RSVP for this event is with Rod. PV Park. We haven't been there in a while, but we have a Meteor Shower / Star Party from 5pm to 10pm that night. RSVP is required. Not enough public RSVP's and the event will be canceled. Volunteers are needed and should RSVP on the PAS public Calendar for this event. More info can be found at this link: <http://www.pasaz.org/forums/calendar.php?do=getinfo&e=73&day=2009-12-11&c=1>.

**Dec 12:** National Space Society Holiday Potluck. RSVP is required by going to the link provided in the forums about this topic at <http://www.pasaz.org/forums/showthread.php?t=366> and signing up with what

food you will bring to the party. THIS IS NOT A PAS EVENT however, PAS members are invited. This event is from 4pm to 7pm as of 11/17, however, Veronica said the times might change, so check the forum for the correct time before you go. The location is a NSS Member's home in downtown Phoenix.

**Dec 12:** PAS Virtual Star Party. Location is still to be decided. Time will be 7pm - ? RSVP is required by going to the link within the forums and signing up to use the telescope or just to attend. Both RSVP's are requested. If you are not going to use the scope, we still wish to know you wish to attend, just in case we cancel the event. The link is: <http://www.pasaz.org/forums/showthread.php?t=322>.

**Dec 17:** PAS Meeting of the Minds 7pm to 10pm. More info can be found at this link <http://www.pasaz.org/forums/calendar.php?do=getinfo&e=81&day=2009-12-17&c=1>.

**Dec 19:** CEO Mayer Star Party. RSVP is with Chris for this event. More info can be found at this link: <http://www.pasaz.org/forums/calendar.php?do=getinfo&e=188&day=2009-12-19&c=1>. \*\*\*

## Pas Social 2010

By Terri, Event Coordinator

The PAS SOCIAL for 2010 will be on Jan 9th at Chris Johnson's home in Good-year. It is the same location as last year. Put it on your calendar and plan to attend. RSVP Is required with Terri.

Bring a main dish, side dish or dessert

per person attending. Bring a drink to share, more than you can drink that night.

We will be discussing, in the forums, foods being brought so there will not be duplicates. Bring a disguised White Dwarf gift per person playing the game with us. Bring your dart throwing arm. More details

will be found in the PAS Forums. Watch for it. If you bring a guest, they must be RSVP'd by you or themselves.

Start and end time of the event will be announced in the January issue of PAS-times. We will see you there for another exciting, fun Social. \*\*\*

# All Arizona Star Party 2009

Bob Christ

Every fall the East Valley Astronomy Club (EVAC) hosts the All Arizona Star Party (AASP) held at Farnsworth Ranch, located south of Arizona City. This event was held on October 16 and 17, and is open to members of all astronomy clubs in Arizona, those outside of Arizona, and those folk that are simply interested in astronomy and have no club affiliation. It is not unusual to have participants come in from other states, north and south of the US, and abroad.

This year's event was, once again, an absolute treat. The sky cooperated and EVAC's hospitality was top-notch. EVAC raffled-off various astronomy related articles that included a 10" Dob and provided a great chili dinner Saturday evening for \$5. Too, they have a table set up to allow one to make coffee, tea, or hot chocolate anytime during the night – a nice touch.

The observing area is quite large and I estimate there were some 100 attendees – perhaps even more. The site is totally flat, virtually void of stones, and makes for very comfortable tent camping and peregrinating around in the dark to the multitude of scopes whose red lights of various ilk serve as lighthouses to guide you to their location. The distant mountains are low and do not interfere with observing even if one is compelled to view objects near the horizon. Members of PAS that attended included me, Tim Jones, Chris Johnson, and Steve Palmer. My apologies if I missed a fellow PAS club member.

Farnsworth Ranch is located between Phoenix and Tucson, and provides reasonably dark skies. Even though the metropolitan light domes of the cities are apparent, I do not find them to be particularly bothersome. The excellent sky Friday evening was better than Saturday, but both nights delivered outstanding opportunity to do visual or imaging.

Several "observations" to share .....

At 103° in the shade (verified by 2 instruments) it is hot, very hot, and heat records were broken on this date. This heat was uncharacteristic for an AASP event and it was difficult, if not impossible, to play catch-up on the sleep willingly sacrificed while observing Friday

night. For those of us not able to benefit from an air-conditioned camper, there was a lesser alternative. The temperature inside the port-a-potties was near oven-like. Upon exiting a potty, one was exposed to very "cold" ambient air temperature – although only for a millisecond. Sometimes it's the little things.

The next time I watch Bridge on the River Kwai I'll have a better appreciation for the discomfort suffered by the character played by Alec Guinness while being sequestered in that tiny tin shed.

The temperature also had an effect on the local fauna. Not only is the AASP held at Farnsworth Ranch, but also the Messier Marathon hosted by the Saguaro Astronomy Club in the March timeframe when it is expected that temperatures will be cool as well. Having attended both events for years, this is the first time it has been this hot and that rattlesnakes emerged.

The high temperature was most probably contributory to their emergence, but also perhaps all of the electronic gear being used that emitted heat, low-level noise, electrical emissions, gamma rays (sorry), etc. that would lead a snake to believe food was near.

It was most disconcerting to find a rattler at the base of one's scope (not mine but very close) and, after appropriate measures were taken (thank you Steve Palmer), the observing commenced. Our rattler surfaced right at the end of astronomical twilight Friday evening so we "lost" about a half-hour of observing time. Damn the red lights – white lights were turned-on when "rattlesnake" was screamed. A second snake was also discovered far across the observing field to the east. Again, both sightings were most unusual.

There was an upside to the high temperatures. Tim and I were armed with large cans of Campbell's soup for an easy Saturday lunch. The paper labels were stripped off the cans and laid on their side on a metal camp table sitting in the Sun. An hour later the soup was sufficiently heated beyond warm to eat without having to fire-up the stove. Also, most of the clothing layers brought to keep one warm during a typical fall desert night proved to

be unneeded. Thinking back, I'd like to do without these two upsides.

I am working on the Astronomical League's Herschel-400 program and identified 32 objects that I wanted to log during my 2-nights while at the AASP. The sky was so co-operative that I bagged all 32 targets Friday evening and then added another 8 Saturday night while also looking at many old favorites. 303 objects logged - 97 to go.

Various reasons have precluded me from viewing the GRS (Great Red Spot) on Jupiter with my telescope. As an old saying goes: it really should have "snowed" on Friday evening. Chris Johnson had his scope set up for visual, not imaging; indeed a rare occurrence! This, so he could try out the new binoviewer assembly he had acquired. It was through Chris' scope that I finally saw the GRS.

I have also been on a quest to see the Horsehead Nebula (B33) in Orion visually in my 9.25" scope. I had the opportunity to view the object through a 16" Dob fitted with an Hbeta filter. Although the scope's seasoned owner counseled me about how to see it, I simply could pick it out. I'm told once you are able to detect the Horsehead visually; you'll be able to pick it out easily the next time and I eagerly await the next time first-time.

Ray Farnsworth recently sold his ranch to investors and leases back a portion of the land and continues to grow cotton. One variety is an interesting cotton/hemp hybrid being supplied to the pharmaceutical industry. The ranch provides a wonderful venue for the Messier Marathon and AASP events and the new ownership is currently amenable to provide the site for these events, but the long-term availability is not clear, nor assured.

As we all know, amateur astronomers are a friendly lot. During the day, great conversations abounded, and during the night spectacular views of objects were shared. Even if you don't have a telescope, I would encourage you to attend the AASP next year. It's free, fulfilling, and a wonderful way to spend time doing something that's astronomically exciting

# PAS Swap meet At December 3 Meeting

Start looking now for those astronomy items you do not use any more. Let's have a great turnout for selling!!! Remember, this is a silent auction. You bring your item, provide a small piece of paper with a description on it and the starting bid. Then, those in attendance wander around making bids to out bid the previous bid, if they want the item. At the end of the meeting, we leave 15 minutes for trading money for item, and everyone leaves happy. Go dig in your attic now. This meeting will be here before you know it.

Also at the meeting, I'd like a collec-

tion of MAGAZINES for donation. Here's what i have in mind. The PAS Library doesn't need to house a ton of magazine back issues of Astronomy Mag or Sky & Tele. So, I'm going to be bringing a bunch of magazines to the meeting for the purpose of "DONATION SALES." What that means is that everyone brings any magazines, related to astronomy, and yes that can include an issue of some other magazine with something in it about astronomy.... we make a pile on the table at this meeting, and then we put up a donation box. The donation box will read "Ten cents a copy or 15 magazines for \$1," and of

course, if you feel you want to donate more than Ten cents and take as more than 10 copies to equal \$1, please do. The money in the box goes to PAS as a donation. The copies that do not sell will be first taken to Bookman's for cash trade... that goes to PAS as well, and then I will donate the rest to Savers (no money received for that donation). So, if you want a copy that is there on the table, purchase it now at Ten cents each, or your discretion on how much you donate to PAS for the copies. If you have copies to donate, please bring them along. Let's have a large magazine pile!!!

## Email Of Events

By Terri, Event Coordinator

I was going through the list of current, 2010 PAS members. I noticed that some of you have email addresses and some don't, and some of those email addresses aren't working. That's right... some of our PAS members are not getting the notices by email, when an event comes in that you might want to attend.

Please, take a moment to see if you have recently received an email from Cosmicstarstuff or Events@pasaz.org. If you have not, be sure to drop me an email with your current email address so that you do not miss out on the events as they are received by me. Those of you receiving the newsletter only get a once a month notice, and you only get what we know about at the time of the Newsletter printing/distributing. The rest of the PAS Membership, which is all but 5 people who get their newsletter via snail mail, receive notices from me telling them of events they may wish to be involved in, as the event comes to me.

So, take a moment to check your email and send me an email if you aren't sure, so that you do not miss out! Over the last month, 2 email addresses for newer members hasn't been working. Mike does what he can to decipher your handwritten email address. I do what I can to verify it works,

and if it doesn't work, I tell Mike, and then I delete you from the emailing list.

The list of PAS members is just a way to get info out to you the day it comes to me. You WANT TO BE on that list so you get all the event info. For instance, let's say a school contacts us. School X wants a star party a week from today. The newsletter doesn't come out for another 2 weeks. How will you get the details needed to attend and assist at that star party? You won't. Then, later you read about the review of that event in the newsletter and think to yourself, I could have helped at that event. But you didn't. Or, "I would have liked to attend that event." So, be sure you are receiving emails

from me and if not, email Events@pasaz.org so I can add you to the PAS Members list.

All event info, once received by me, for Scout & School star parties can be found in the Members Forums. Be sure to RSVP your attendance. \*\*\*



## PAS Meetings Are Moving

Written by Terri by request of Dave & Rod

The PAS meeting and the PAS Meeting of the Minds (MOM) will be held from the December meeting forward, in G-147 on the PVCC campus. At the November PAS meeting, some students were com-

plaining the PAS meeting attendees were too loud for them to study. So, we have decided to move all PAS meetings to G-147. All events, and anything else we do at PVCC will be in G-147. You can arrive as early as 7pm. Choose a location at the back

of the room for snacks and handouts. Since our next meeting is the SWAP MEET, please put your items along the back wall for SILENT AUCTION. We will see you there!!! \*\*\*

# PAS Forums & Online Calendar

By Terri, Event Coordinator

What's scheduled with PAS? Well, to find this information, one could visit the Newsletter, which has the current upcoming events as of the printing date of the newsletter, or one could visit the PAS Forums. To do this, you create an account on the PAS website at [www.pasaz.org](http://www.pasaz.org), and then you click on the word "Register" in the upper left hand corner. We ask that PAS members sign in using their first name, a space, and their last name. Once registered, email Chris at [webmaster@pasaz.org](mailto:webmaster@pasaz.org) and let him know you are a PAS member and you need your membership on the PAS website upgraded to PAS member, rather than Guest. This will give you access to many things on the site.

One of the most interesting locations to hang out would be in the PAS Forums. Go into the Forums button, along the top of the webpage, and it will give you 2 sections. The top section is everything PUBLIC. That means, don't post anything PAS Only in that area. The second sections is your link to WHAT'S HAPPENING IN PAS. Especially the area labeled UPCOMING PRIVATE EVENTS. In here is a list of events that are scheduled... if a school asks for a star party, a scout group or an organization wishing to hire PAS, this is

where you find out all the details you need to know to be able to RSVP, attend and help out. It is important that you review the star party you have chosen to attend, prior to attending it. The info in those forums is what I've discussed with the contact for that event (ie, a teacher from the school, or the scout master or event coordinator for a scout event). So, everything they and I have discussed about their event is in this forum area. RSVP for these events is in the Private PAS Calendar. If it is a Public event, then in the upper area of the forums, the Public section, will be Upcoming Public Events. This will have events listed such as upcoming PVCC star parties, or the Indoor/Outdoor Events, or PV Park events. If it is a public event, you can find it listed in this section, and all details you would need to know about the event will be in the forum thread for that event. RSVP for these public events is in the Public RSVP calendar. If you are unsure of how to navigate, sign up, or use the website. Let Terri know and we can have Chris do a training class at one of the Meeting of the Minds so that all our PAS members can benefit from the use of the PAS forums. They really are a great way for the Event Coordinator to get the info out to YOU, the PAS members who might want to volunteer at these events.

Please note: All events are listed, public or private on the Public Event Calendar to show that the date is taken. If it is a Private event, a listing in the private calendar will also be available and that's where the PAS members RSVP for the private events. I had to put all events on the Public calendar because I've asked the schools to make sure their event doesn't fall on a date that is taken by another event PAS is doing. I do not wish to double up our efforts to cover School star parties this year. So, before I accept their Booking Doc and confirm their star party, they HAVE TO visit the PAS calendar and be sure there is no other event on the date they choose for their star party. That is why we have events on both calendars. All events are listed on the Public calendar, and have links to the Private Calendar if it is a private event. The Private events are also labeled (Private) in the name of the event on the Public Calendar. Come be part of the PAS Telescope TEAM by checking the PAS forums on a regular basis for information about upcoming events.

Definition of a Private Event: Any event in which the General Public is not allowed to attend: Schools, Scouts, & Paid Star Parties. \*\*\*

## HALLOWEEN PARTY AT MIKE'S 10/31 Review

By Terri, Event Coordinator

Photos of this event are at:

[http://www.pasaz.org/forums/gallery.php?g2\\_itemId=4703](http://www.pasaz.org/forums/gallery.php?g2_itemId=4703)

Ever notice how the photographer of an event doesn't end up in her own photos of the event? Yea, that's what happened this year.

It was a very good party. Many thanks goes to Mike for hosting it. If Halloween falls on a weekend evening again next year, Mike might want to host another party.

A few people arrived before the Finches, but once I was there, photos were taken. One of the first to arrive was Austin Powers (Frank) and Chet / Einstein (Sam). They had very good costumes and were part of the LIFE of the party. They brought fried chicken to the potluck. Yum! Then, there was the Hippie (Mike). Very nice outfit. Later on we find that Kevin gave him a special sign for above the door to his home.

You'll have to visit the link above and see the photos to find out what that sign said. Then we had a photographer (Don) and Arthur Dent (Kevin) from HitchHiker's Guide to the Galaxy. It's it awesome to be able to run around all day long in your PJ's carrying your precious TOWEL? Kevin brought Nachos to the potluck. A Vampire (William) appeared out of now where and was very frightening. The Vampire and his wife (Me - I came as a Flying Cat trainer - Sapphire sat on my shoulder) brought many boxes of Pizza to the party. A cowgirl (Judy) showed up at the party. Then the Wurst's arrived and we all began to eat. The food was great. Thanks to everyone who brought something awesome to eat. We had a Hunter (Bruce), A show girl (Bette), and an Amateur Astronomer (Ed) arrive.

Thanks to everyone who brought decorations and then took them home after the party.

Many thanks goes to Sam for bringing the Astronomy Monopoly. After the eating was finished and while Mike entertained everyone else, Sam, Don and I played Astronomy Monopoly. That was fun. Don took 1st place, Sam had 2nd, and you know that leaves me as the last, but it isn't whether you win or lose, but how you play the game. I don't think Don or Sam would have cared if they lost... it was fun just to spend time with friends playing the game. Congratulations to Don!

Then we retired to the living room, gathering around the big screen TV and enjoyed a movie "Watchmen." After the movie, most of the party broke up, but a few stayed behind for even more fun at Mike's party. Thanks to all who attended and enjoyed the evening with us! \*\*\*



# Arizona Sky

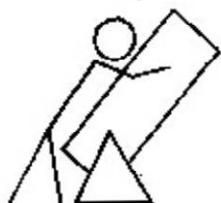
In the southern sky of early winter is Cetus the whale. To find Cetus, we follow Orion's belt to the right, to the V-shaped head of Taurus the bull. Like an arrow-head, Taurus points southwest toward a single star, followed by a pair of stars, followed by a ring of six stars; this ring represents the head of Cetus. Several stars in the ring are relatively faint, and visible only in dark skies (two are magnitude 4.8 and two are mag 4.3), so if you see only three stars in a zigzag line, you are probably seeing the two southern stars of the ring (Menkar and Kaffaljidhma, mag 2.5 and 3.5) and the first star in the whale's body (Delta Ceti, mag 4.0). About 20 degrees west of this group is a trapezoid of faint stars (mag 3.5), followed 10 degrees later by a brighter star, Diphda or Deneb Kaitos (mag 2.0). Diphda and the nearby trapezoid represent the whale's tail.

In August 1596, the German astronomer David Fabricius was observing planetary positions, and he recorded a nearby 3<sup>rd</sup>-mag star in Cetus as a reference. However, over the next few weeks, he was surprised to notice that the reference star became gradually brighter, then fainter, till it was no longer visible. Then, in the following February, the star reappeared. Johanne Hevelius later named it "Mira", which means "wonderful" in Latin.

Mira, also known as Omicron Ceti, varies from mag 3 to 9 over a period of about 11 months – and it is currently at its maximum right now! It is approximately in the center of Cetus, a little less than half of the way from the whale's head to its tail.

Mira is truly an amazing star – it is an unstable red giant towards the end of that stage, alternately expanding and contracting as it runs out of helium to fuse. It is about 8500 times as luminous as the sun, and its radius varies between 400 and 500 solar diameters. If Mira were at the center of our solar system, its radius would vary from the orbit of Mars to the asteroid belt.

Mira's core is now made mostly of carbon and oxygen, surrounded by very thin layers where hydrogen is still being fused into helium, and helium into carbon. Around this is a less-



Active Spiral Galaxy M77



Spiral Galaxy M74

# Arizona Sky

dense envelope of hydrogen and dust which is gradually being depleted by a strong stellar wind. This process will turn Mira into a planetary nebula some time in the next million years or so.

Mira has a 9<sup>th</sup>-mag white-dwarf companion only 60 a.u. away, that has been imaged by the Hubble Space Telescope. The pair is about 400 light years from us.

The winter sky includes several other famous variables. Mira was the first variable star discovered in modern times. But not far away, in Perseus, is the star Algol, whose name (meaning: "the demon") indicates that its variability was apparently noticed even in ancient times. In the picture of Perseus, Algol is the eye in the Medusa's head that Perseus is holding.

Algol is about 90 light years away from us. But unlike Mira, Algol is not a true "variable star"; it is an eclipsing binary. It consists of two stars that are revolving around each other: a blue B star of magnitude 2.1, and a yellow-orange K giant, mag 4.5. About every 3 days, the fainter K star moves in front of the B star and blocks it out, dimming Algol to mag 3.5 for about ten hours. There is also a third member of the system that revolves around the other two with a two-year orbit.

Another famous variable is Delta Cephei, a yellow-white supergiant located about 1000 light years away. It is about 2000 times as luminous as the sun, and about 40 solar diameters wide. (In the center of our solar system, it would reach halfway to the orbit of Mercury.)

Once every 5.37 days, Delta Cephei brightens suddenly to mag 3.5, taking about a day and a half to do so, then gradually fades back over the next four days to its minimum magnitude of 4.4. This pattern of sudden brightening and gradual fading identifies the Cepheid variables, of which Delta Cephei is the prototype.

At the beginning of the 20<sup>th</sup> century, Henrietta Leavitt noticed that Cepheid variables with longer cycles have a higher absolute magnitude. This discovery enabled them to serve as "standard candles" for measuring distances, and was a deciding factor in Edwin Hubble's determination that the Andromeda Galaxy and other "spiral nebulae" are actually separate galaxies rather than nebulae within our own galaxy.

Cepheid variables are high-mass stars that have finished fusing most of their hydrogen to helium. Gravity causes them to contract, but the increased pressure then heats the gas and causes the star to expand. These pulsations cause the star's luminosity to increase and decrease regularly. The star is brightest in its expanded phase.

Delta Cephei is also a double star. It has a 7<sup>th</sup> mag blue companion about 0.2 light years away from it (12,000 a.u.).

In Cetus and its neighbor Pisces, we can find some interesting galaxies from Messier's list. Near the head of Cetus, adjacent to the star Delta Ceti that we mentioned earlier, is M77 - an "active galaxy" with a compact nucleus. Its spectrum shows that it is ejecting large clouds of gas from its core at high speeds, possibly as a result of a massive black hole.

Near the star Eta Piscium is a very faint but beautiful spiral galaxy, M74. Its low surface brightness makes it hard to find visually, but photographs display its beautiful spiral arms. Pictures from the Hubble Space Telescope show details of dark dust lanes and pink star-forming regions.

Both galaxies are about 100,000 light years across. M74 is about 30 million light years away, and M77 is about twice that distance.

Back in our solar system, Mercury will be an evening star this month. It won't get very high in the sky, but might be visible in

twilight if you have a clear western horizon. The best view will be in the middle of the month.

Jupiter, Neptune, and Uranus are still in the south at sunset, but setting much earlier than last month. Jupiter and Neptune set around 11 pm at the beginning of December, and around 9 pm towards the end of the month. Uranus follows them by about 2 hours.

Mars will gradually be getting brighter and larger. It will rise around 10 pm at the beginning of December, and 8 pm at the end of the month. By the end of December it will be about 70 million miles away, with a diameter of 14 arc sec. In January we'll have an even better view.

Saturn will be rising around 2 am at the beginning of December, and midnight towards the end of the month. But the morning star Venus will be disappearing from our view after midmonth. Venus will reappear as an evening star in February.

The full moon will be between the Pleiades and Hyades on December 1-2, with a repeat performance on December 28-30. The moon will be near Mars after 11 pm on December 6-7, and near Saturn on December 9 and 10 after 1 am. On December 17 and 18, the crescent moon will visit Mercury in the west after sunset; on December 20 and 21 it will be near Jupiter; and on December 19 it will be between the two planets.

The Geminid meteor shower on December 13-14 is around the time of new moon, promising good visibility for those who are willing to dress warmly and brave the cold winter night.

Join us next month when we continue to explore the winter constellations. And till then - wishing you clear skies, and happy observing!

## Imagine Elementary School Star Party Nov 23 Review

By Sam Insana  
November 23, 2009 was the Imagine Elementary star party. 5 PAS members attended. Frank showed the first quarter moon, Sam showed Gamma Andromeda double star system, Steve showed Andromeda Galaxy, and Chris showed Jupiter. Mike fascinated the kids with his

meteorite display. There were about 100 children from about 2 years to 12 years old, and about 100 adults (parents and teachers). Seve was the 7th Grade math and science teacher who set this up with Terri at PAS. He is teaching astronomy to his students and they asked lots of questions and seemed very interested. The field

was irrigated, so we set up on the basketball court. There were a few bright lights, but Seve was able to cover them with dark paper which helped. The star party lasted 2 hours, from 7 to 9 pm. Mike gets the long distance award, driving well over 100 miles round trip. Sam Insana, PAS member.\*\*\*



# A Cosmic Crash

by Patrick Barry and Dr. Tony Phillips

Two small planets hurtle toward each other at 22,000 miles per hour. They're on a collision course. With unimaginable force, they smash into each other in a flash of light, blasting streams of molten rock far out into space.

This cataclysmic scene has happened countless times in countless solar systems. In fact, scientists think that such collisions could have created Earth's moon, tilted Uranus on its side, set Venus spinning backward, and sheared the crust off Mercury.

But witnessing such a short-lived collision while pointing your telescope in just the right direction would be a tremendous stroke of luck. Well, astronomers using NASA's Spitzer space telescope recently got lucky.

"It's unusual to catch such a collision in the act, that's for sure," said Geoffrey Bryden, a cosmic Crashspitzer astronomer specializing in extrasolar planet formation at NASA's Jet Propulsion Laboratory and a member of the science team that made the discovery.

When Bryden and his colleagues pointed Spitzer at a star 100 light-years away called HD 172555, they noticed something strange. Patterns in the spectrum of light coming from nearby the star showed distinctive signs of silicon monoxide gas — huge amounts of it — as well as a kind of volcanic rock called tektite.

It was like discovering the wreckage from a cosmic car crash. The silicon monoxide was produced as the high-speed collision literally vaporized huge volumes of rock, which is made largely of silicon and oxygen. The impact also blasted molten lava far out into space, where it later cooled to form chunks of tektite.

Based on the amount of silicon monoxide and tektites, Bryden's team calculated that the colliding planetary bodies must have had a combined mass more than twice that of Earth's moon. The collision probably happened between 1,000 and 100,000 years ago — a blink of an eye in cosmic terms.

The scientists used the Spitzer space telescope because, unlike normal tele-

scopes, Spitzer detects light at invisible, infrared wavelengths.

"Spitzer wavelengths are the best wavelengths to identify types of rock," Bryden says. "You can pin down which type of rock, dust, or gas you're looking at."

Bryden says the discovery provides further evidence that planet-altering collisions are more common in other star systems than people once thought. The "crash-bang" processes at work in our own solar system may indeed be universal. If so, Spitzer has a front row seat on a truly smashing show.

See Spitzer Space Telescope's brand new Web site at <http://spitzer.caltech.edu/>. Kids can learn about infrared light and see beautiful Spitzer images by playing the new Spitzer Concentration game at <http://spaceplace.jpl.nasa.gov/en/kids/spitzer/concentration>.

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



Artist's rendering of cosmic collision involving two objects whose combined mass was at least twice that of our Moon. Discovered using the Spitzer Space Telescope in the planetary system of a star called HD 172555 100 light-years away.

# October 29th Meeting Of The Minds Review

By Terri, Event Coordinator

Photos can be seen at:

[http://www.pasaz.org/forums/gallery.php?g2\\_itemId=4616](http://www.pasaz.org/forums/gallery.php?g2_itemId=4616)

What an awesome meeting. There weren't many in attendance and so the meeting flowed very nicely. We have a few people chatting off to the side and not paying attention to what was going on. The meeting opened with a discussion on the Moon Crash. Sam had brought a VHS with the Moon Crash on it. It wasn't very long and it appeared the scientists on the video were as lost as we were.... no plume, as expected, no sign of anything having hit the Moon. Thank you Sam for sharing that with us.

Then we turned our topic to the results of the Follow up phone calls to the Resorts to which we, as a TEAM, mailed out and then called to let the resorts around Phoenix know we existed. The results weren't very good. We have one more person to hear from as far as the results of this project goes. Greg Torda took a larger stack of post cards and said he'd take care of doing the follow up with them but then didn't make it, due to an arm in a cast, to the MOM's to share his info. So, we hope to see him at the next MOM's with the data we need. But what we did find out is what everyone is experiencing.... Cut backs, lack of money, etc, due to the economy. A couple resorts showed interest and the rest didn't seem to want anything to do with us.

Mike covered the Carefree Inn and they said NO. He also did the Boulders and Copperwynd, but didn't follow up with them. Sam did an awesome job with his resorts. Thank you SAM. We have 2 resorts who are interested but probably can't afford us just yet until the economy picks up. And Rod got the same results as the other calls, can't afford to even keep their own employees employed. So, this isn't looking good but at least we have an idea of what is going on out there, and why we haven't been called to do any jobs for them. Next we need the data Greg has gathered and the project, as far as the follow up calls will be done. Next step will be discussed at the December MOM's or the November MOM's if there is any time left after Chris's class. Chris is running the meeting and has the whole 3 hours to fill, if he desires to do so.

The next important topic we discussed was whether we should be charging the

Scouts, Private Schools, Public Schools and Churches for star parties, how much and when? And how long should star parties be offered, that are free, length of star party. So, here's what we concluded. The Telescope TEAM discussed this. If you weren't at this meeting and you are part of that TEAM, you should have been there to put your 2 cents in. We made the decisions and then Terri updated the Booking Doc to reflect those decisions. Here's a brief on what was decided.

Star parties will be 2 hours in length for the agreed upon amount of money, or for free, if it is a qualified organization. To see the changes, go to this link and download both the BOOKING DOC and TELESCOPE FEE CHART: <http://www.pasaz.org/forums/downloads.php?do=cat&id=7>.

For Public Schools – 2 hours free then \$50/hour after that. If star party is over 1.5 hours long, we request refreshments.

For Private Schools - \$125 for first 2 hours then \$50/hour after that. If star party is over 1.5 hours long, we request refreshments.

For Scout Groups - 2 hours free then \$50/hour after that. If star party is over 1.5 hours long, we request refreshments.

For Private Parties – Base Rate (See Telescope Fee Chart) and then \$100/hour after that.

For Churches - \$125 for first 2 hours then \$50/hour after that. If star party is over 1.5 hours long, we request refreshments.

Now to clarify the times. If the star party starts at 7pm and goes to 9pm, that is what they are paying for. PAS Telescope TEAM members need to show up at 6:30pm for set up, and can not take down their scope until the agreed upon time for ending the star party is met, in this case, we pack up at 9pm unless they have paid for additional time. As Event Coordinator, I will have that info and who ever is RSVP collects the checks before the star party begins, for the additional time requested. I will request that up front. Additional time must be paid for prior to the beginning of the star party except for situations where a corporate account needs to pay us and they always mail the check in full. But for all the rest of the star parties, a check or cash up front for the additional star party time will be requested by me so that the RSVP person can get it without hassle. Now that we

have a time set... everyone knows not to stay later than 2 hours unless you wish to, on your own time.

Also, don't forget, we have quite a few schools plus Temple Beth that are Grandfathered into this, meaning they keep their deal then have with us previously. Temple Beth pays \$100 and we are there from ½ hour prior to the start of their event, until their event ends, which is usually 2 hours later, but not always, sometimes longer. And some Schools and Scout groups have us longer, depending on what we did for them previously. If I can arrange payment for additional time with them for future events, I will. Watch in the forums for info regarding what we have as a deal with the star parties you are attending so you know what to expect. And remember, if you are expecting payment, you get it when it comes to PAS. Not before.

We had a very good discussion on this and decided a lot of changes to the Booking Doc. What caused this discussion was that a school contacted PAS asking us to do a star party. It is a School that would otherwise be FREE... but because they had Tony LaConte attending the event and paying him, Sam and some others wanted to put it in writing for what is expected when a school contacts us in the future for an event. If Tony can charge \$400+ for a star party, why can't PAS get some of that fee..... ? So, we started this discussion and now we have it set for all future star parties... They fall into one of the categories listed above and we will stick to that schedule as best as we can. It might limit the number of star parties we get to do, but then, if they want us bad enough, they can pay for it.

Another item we discussed was the making of a PAS Brochure with the intent of visiting the local Resorts we just contacted, and leaving it in their Brochure area for the public to pick up and hire PAS to do private star parties. We found one that was well done for a group out of Sedona that offers private star parties for the public. So, at future MOM's we will be discussing the wording, the pictures to include, the size of the Brochure, 1 sided or 2 sided, etc... You might want to attend those MOM's to get in on this discussion. Don has offered to duplicate the brochure, print it. We just need input as to what to put on this brochure. An example of the brochure has gone home with several PAS Members who want to add their 2 cents worth to the project. A

## October 29th Meeting Of The Minds Review

Forum Thread will be started for this discussion as well. Watch for it. That wraps up

a very well thought out, productive Meet-

ing of the Minds. We hope to see you at the next one. \*\*\*

## Scout Star Event at Saguaro Lake Oct 24 Review

By Bob Christ

Tim Jones and I shared the sky with Cub and Boy Scouts working on their astronomy belt loops (Cubs) and merit badges (Boy Scouts) on Saturday, October 24. We both had been Scouts, so this was a kind of "homecoming" for us.

The event was held at SRP's campsite located just downstream from the dam at Saguaro Lake. Upon passing through the code-required gate we entered into a very nice recreation area for such an event to be held. It was free-time when we arrived, and numerous children and adults were taking advantage of a large grass field to play. It was on this field that we set up the scopes. Sheer, high cliffs to the south not only provided a magnificent sight but also a protected area that bald eagles call home. Numerous tents were set up and all were having a grand time.

After we set up our equipment, our contact Mary Skinner introduced us to a number of scout leaders prior to enjoying a wonderful spaghetti dinner. It was dark following dinner and we all headed to the scopes. I was surprised that the Milky Way was just barely visible and imagine on a night of good transparency and seeing it would be displayed beautifully at this site.

Tim held "Cub Scout Court" to provide information pertinent to their quest for astronomy belt loops and answered their questions while I worked with Boy Scouts and adults prior to the onrush of eager eyes when Tim's session ended. A significant number of parents attended the event and they too exhibited high interest.

My telescope was initially trained on the Andromeda Galaxy and it generated a lot of interest. One of the scouts said he couldn't see anything, and, thinking per-

haps that the scope had been knocked off-target, I looked through the eyepiece to see a gray field of view. Looking up, I saw the clouds that were projected to arrive at around 10PM had shown up early. Ugh! We then bounced around the sky the remainder of the evening, showing objects located within the cloudless areas. The Moon and Jupiter were huge hits and we also showed the Coathanger asterism, M13, M57, and the Pleiades.

At one point I felt a tug on my trousers and saw a small boy trying to get my attention. I leaned over (very far) and he said to me in a simple declarative sentence: "I'm not a Cub yet, I'm in Kindergarten." It was a precious moment.

Our support was very much appreciated, and we appreciated the opportunity to share our scopes and knowledge that evening with the wonderful Scouting organization.

## Speaker To Begin Promptly At 7:30PM

By Terri, Event Coordinator

Our Guest Speaker, Ken Herkenoff, is making a trip down to do this awesome presentation for us from Flagstaff. Due to that, he wishes to close his portion of the meeting at 9pm, including Q & A. So, we would like to open the meeting at 7:30pm and without announcements or any other delays, let Ken take the floor at about 7:32pm.

Then, when he has completed his presentation, we will do announcements, the 50/50 raffle, the Silent Action. And what's really cool, is we are in G-147 and we do not have to run out of the building at 9:30 any more. G-147 is available to us to 10pm. Thus, if we have a speaker, in the future, who runs longer than planned, he/she can have 15 or so extra minutes to complete their presentation. Plus, this also means that those of you who love to chat after the meeting, and

socialize, you may do it right there in the room after the Speaker has given their full presentation. We hope to see you at this awesome meeting. It is a full night of Astronomy. Everyone is welcome. Bring a friend. Bring your items for the SWAP MEET, and bring those old, dusty magazines you wish to part with, by donating them to the PAS MAGAZINE SALE. All proceeds donated go to PAS. See you there! \*\*\*

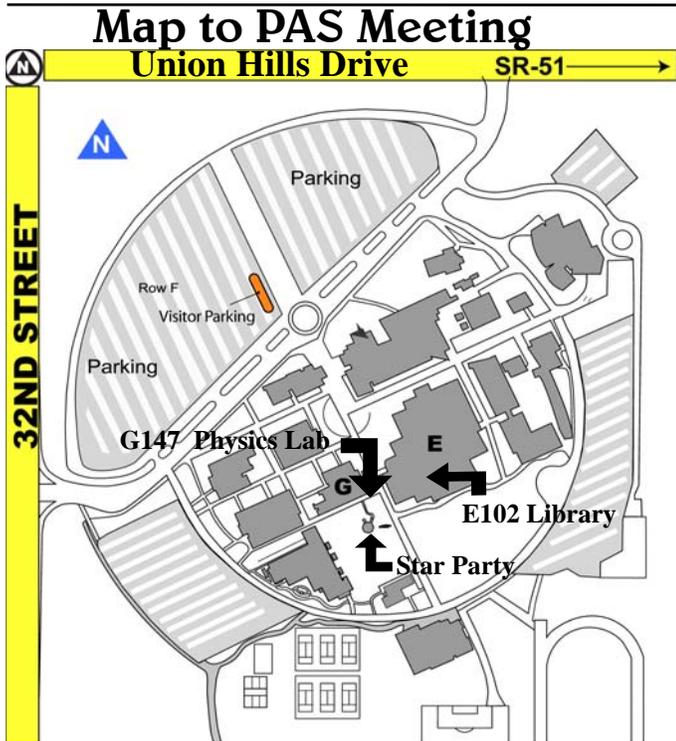
## 1st Successful Virtual Star Party 11/21 Review

By Bruce Meyers

I want to thank Chris for his fabulous hospitality, educating me on remote astronomy and image rendering, and the use of his awesome gear! The VSP was fun, good folks and of course educational. I came home with a great photo of NCG 891

edge-on spiral galaxy that I can practice some of the image editing techniques that Chris showed us. Rod successfully targeted three asteroids in one photo frame in a photo series and we all were excited to see his results when he blinked between the first and last frame and we could all see

the three asteroids moving in relation to the fixed stars. I must say this was a very exciting VSP with the variety of captures and to experience advanced astronomy in action. \*\*\*



See page 2 for more information

## December

Sun	Mon	Tue	Wed	Thu	Fri	Sat
		1	2	3 PAS meeting	4	5
6	7	8	9	10 PAS Telescope Training Workshop	11 Meteor Shower / Star Party	12 National Space Society Holiday Potluck VSP
13	14	15	16	17 PAS MOM	18	19 CEO
20	21	22	23	24	25	26
27	28	29	30	31		

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Ads in PAStimes run for a month and may be renewed on a month by month basis, if submitted by deadline, space permitting. Ads in PAStimes are FREE to members all others are asked to make a small donation. Donations are to be sent to the Vice Prez who will forward them to the Treasurer.

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

To:

## PAS Speaker Line-up for Winter 2010

By Terri, Event Coordinator

Dec 3: Ken Herkenoff: CCD Imaging from the Mars Explorer Rover

Jan 7, 2010: Veronica Zabala

Feb 4, 2010: Jerry Snow: ArcheoAstronomy

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## What's Up For December?

By Rod Sutter, PAS President

### Planets

Name	Date	Rise	Set
Mercury	12-1-09	09:24	18:13
Venus	12-1-09	07:17	16:59
Mars	12-1-09	22:33	12:49
Jupiter	12-1-09	12:50	23:01
Saturn	12-1-09	02:28	14:38
Uranus	12-1-09	14:08	01:49
Neptune	12-1-09	12:53	23:15
Pluto	11-2-09	09:35	19:25

All Times Arizona Time

Dec 15 2009

**Sunrise: 07:23**

**Sunset: 17:23**



**Full:December 2**



**Q3:December 9**



**New:December 16**



**Q1:December 24**