

# PAStimes

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PHOENIX ASTRONOMICAL SOCIETY — ESTABLISHED 1948

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## Mike Marron to Speak At March 4th Meeting

On March 4th at 7:00 PM at the Paradise Valley Community College library, the Phoenix Astronomical Society will hear a lecture by Mike Marron on Exploiting Space for Power and Profit. Mike will tell us how Earth's current and future resources are space-related and what needs to be built.

Mike Marron was born into amateur astronomy as his father worked at the Rodger B. Chaffe Planetarium inside the Grand

Rapids Public Museum in Michigan. His parents have been officers of the Grand Rapids Amateur Astronomical Association for many decades, and in the early 1960's allowed the museum/planetarium/astronomy club to build and run the James C. Veen Observatory on a hill behind their solar-heated home with wind-mill generator. Mike began teaching astronomy and science to the public at a very

early age. He has worked out new solutions to quantum mechanics, planetary geophysics, stellar astrophysics, and galactic evolution that astound professors. Known widely for his collection of meteorites, Mike continues to teach science to the general public, administrators, and PhD's. He is currently treasurer of the Phoenix Astronomical Society, member of Mensa, and the Moon Society.

## February PAS Meeting Review

By Terri, Event Coordinator

We all met in the Library. I want to thank everyone who kept their voices low. I have not heard that we were too noisy this time. Thank you! Let's try not to get thrown out of the Library.

At the meeting we had pizza, donuts, cookies, and water. And we drank a lot of water this time. I hope everyone enjoyed the snacks. The pizza was provided by Joe and Renee. They deserve a huge THANKS. Ed and Bruce brought the donuts and cookies. I didn't see any other items to munch there, but if I missed sending thanks to someone else for bringing snacks, please accept it now. Thank you!!! The Water, purchased by Ed, was paid for by PAS. PAS will try to always have water bottles at every PAS meeting. Which brings me to the next item.... Many thanks goes to everyone who donates to the snack fund. We are getting a good size nest egg saved up. I hope to invest in the water supply for the rest of the PAS year - Mar, Apr and May, sometime soon and having the cash to do it beforehand is awesome Thank you for your donations to the Snack Fund. So, everyone had lots of pizza. I am glad you enjoyed it.

The meeting opened with Terri.... Rod, our Prez, was running late. A few super brief announcements happened: bathroom, snacks and snack fund, handouts, Tshirt sales. Then we gave the floor to a timed 15-second intro to a printed Email that Sam had brought to the meeting. We passed it around and giggled. Thank you Sam. Jerry Belcher then took the floor with a 10-minute presentation on his rocket. He calls it the Kevin Rocket. Kevin had won this rocket at a previous PAS Social and over the years, didn't do anything with it, so gave it to Jerry, our Rocket Man.... to send it into the sky when it was ready. So, at the end of this month, there will be a Rocket Launch on Saturday, Feb 27, and the Rocket named Kevin's rocket, will fly. You might want to attend that event. More info can be found in the PAS Private Calendar and at the website listed on the back of this newsletter after Jerry Belcher's name.

Then we turned it over to our guest speaker. In the photos on line, in the PAS Photo Albums, you can see that Dave Hellman was helping our guest speaker by advancing his slides. It was an awesome presentation. Jerry Snow did a live action demo of the Summer Solstice Sun (using

Bette), the Winter Solstice Sun (Jenny), and the Moon (Rod) as the action. Awesome demo!!! Many people expressed their enjoyment of the night's topic and the speaker. Jerry Snow was awesome. Very entertaining and informative. I grabbed about five each of the four handouts Jerry brought with him for the presentation. You may pick them up at the next several PAS Meetings until they are all gone. Many great photos were shot and are available for you to view online. Thank you Jerry for your insightful, intriguing presentation. We will have to have you back again, sometime, for a repeat performance.

As the meeting came to a close and Jerry ended his presentation at 9:15, we scrambled, and this was the fastest the PAS membership ever moved... to get out of the Library before it closed. Wow, we moved so fast, i think we were faster than lightning! Thanks goes to everyone who helped clean up at the end of the meeting. And I really didn't get to say "thank you" enough to Jerry Snow. I'll have to do that by email. It was a meeting that was well worth attending: fun, filling, and you should have been there!!! See you at the next meeting in March! \*\*\*

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## Virtual Star Parties Using C.E.O. & A Class At Kitt

Chris writes: I'd recommend that any club member seriously interested in the Virtual Star Parties consider this course. It will help them understand how to do astrophotography at the PAS VSP events.

### INTRODUCTORY ASTROPHOTOGRAPHY

Friday-Sunday, Mar 19-21, 2010

Friday-Sunday, November 12-14, 2010

To be held at Kitt Peak: This exciting 3-day workshop is intended for amateur astronomers ready to take the next step and plunge into the exciting world of astrophotography and image processing. We will cover everything from the history of photography itself to modern cameras, web-

cams, and CCD image processing. Avoid years of false-starts and costly mistakes as you learn how the pros create those stunning astrophotos seen in books and magazines. Meals and lodging provided. Reservations required. \*\*\*

## New Addition To Pas Photo Albums On Line

By Terri, Event Coordinator

At the PAS Social, the beginning of January, I was taking a bunch of photos. Some of you have looked at all 180 photos I posted to the PAS Social 2010 (link: [http://www.pasaz.org/forums/gallery.php?g2\\_itemId=5295andg2\\_page=22](http://www.pasaz.org/forums/gallery.php?g2_itemId=5295andg2_page=22)) photo al-

bum on line already. Well, new to this album are the 20 videos I took that same night. I was looking for a free program on line to convert the videos from AVI to something that almost anyone can view in Windows Media Player.

I have posted those videos after converting them, and placed them in the locations where they would be, time-wise, as the event progressed. Feel free to download and enjoy them. They are there as the rest of the PAS Photos, to have a historical record of what we do at PAS. \*\*\*

## PAS Meeting of the Minds Review 1/28/10

By Terri, Event Coordinator

We had a lot of good discussion at the meeting. You should have been there!!!! I'll review each topic briefly.

Post Card Project: Greg came to the meeting and told us about the same thing we found out from everyone else, except that he did find one gal who was interested, but couldn't remember who she was at the time. He is going to email that data to me when he finds it. The general consensus has been that the resorts aren't hiring anyone for anything special because of lack of funds. When the economy crashed, so did the desire to hire extra amenities such as star gazing. But, at least the name PAS got out and the post cards were mailed out, and the resorts know about us for future possible jobs.

Wigwam school: This discussion started prior to the meeting. Rod, Don and Steve got together at Dave's computer and found where the school was and what needed to be asked of our contact there, for where to set up. Then, we projected the map on the

screen and talked about where we want to hold the star party. Now, I will contact Eric and let him know what we have in mind, and see if it fits the plans. The Wigwam school star party is 4/17 and we can use all the volunteers we can get. Sign up today!

PAS Flashlights: For a previous event, PAS ordered little red flashlight / key chains with our info on them. Well, they haven't been being sold. So, I mentioned that we should give them away at events. It's not like we need the money. PAS is financially doing alright. So, it was voted, instead of hanging on to them to try to sell at events, we will use them as prizes for the games we play with the kids at schools when we do a star party. The group voted on this.

Speakers: I wish to thank Mike and Chris for offering to do a presentation for PAS. Watch the speaker list for details on who is doing what topic on what date. Many thanks goes to those two wonderful PAS members. And we have a special meeting: June 3 Dave Hellman will be a

guest speaker. We will most likely be in G-147 for this meeting. I'll get more details from Dave.

Astro Day Apr 24th: Many ideas were shared but before we departed the meeting Mike offered to do an Astronomy Day potluck / star party at his home. Details will be in the April Newsletter.

Treasury Report: We have over \$12,000 in the bank and PAS is doing well, financially.

"Some discussions will be started in the PAS Forum. PAS members ho care to add input, should visit the Forum discussions in PRIVATE MEMBER DISCUSSION. Please visit and add your "two cents" to the discussions. This is how we chat about things that need to be talked about, since we just don't have the time to talk about all of it at the MOM's.

It was a very good meeting. Thanks to all who attended. Photos of this event can be found on line in the PAS Photo Gallery. We hope to see you at the next MOM. \*\*

# TELESCOPE TRAINING WORKSHOPS and INDOOR ASTRO EVENTS

By Terri, Event Coordinator

These two kind of events are designed to inform, educate, and be enjoyed as a training session as well as a star party. Let me explain below:

Telescope Training Workshops: Bring your scope and accessories. Learn to use your scope indoors, where there is light, then take it outdoors where the rest of the scopes are set up and learn to use your scope by

night. The next several Workshops are on 2/11, 3/11, 4/15, 5/13, 6/17, 8/12, and 10/21. RSVP in the online PAS Calendar, today!!!

Indoor Astronomy Events: We have an indoor and an outdoor portion to this event as well. Indoors we have many hands-on demos, tons of handouts, and people to talk to about astronomy to learn more. Sometimes we can also help you with your tele-

scope. Then, outdoors we have night-time viewing. Again, help with telescopes is offered if you ask. The next Indoor/Outdoor Astro Events are 4/22 and 10/14.

Thus, these two events are similar in that you can get the telescope training you are looking for at no cost to you. But your RSVP is required for attendance and the weather has to be decent. We hope to see

## COLOR COPIES OF NEWSLETTER - Donations Requested

By Terri, Event Coordinator

I was noticing that at the PAS meetings we sometimes have some of the PAS members, who have internet access, picking up the Color copies of the Newsletter from the handouts table. I'd like to remind you that these 5 copies are not meant for the PAS Membership to pick up. If you receive your Newsletter by postal mail, then you already have a copy that Don has sent your way. If you are signed up for Internet, on the dues sheet, that means you need to go to the Newsletter section of the website and download a copy for yourself.

What I'd like to see is more PAS members, donating back copies of the Newsletter they do not wish to keep. If you take a color copy, that's one less you will have provided to the public. Don only prints 5

color copies to bring to the PAS meeting for the public... for those who are not already PAS members. So, before you pick up a copy, and if you are having difficulties downloading the newsletter from the website, please drop me an email at Events@pasaz.org and let me know and I'll add you to the list of folks who are sent a copy by email each month as the newsletter becomes available.

Some of our members are having trouble downloading it from the site, so I attach a copy of the recent Newsletter, when completed, and email it to them. It doesn't bother me to add you to the list. Just let me know you need me to do that and which email address to email it to. But please, unless you really need a color copy, we prefer you download your own copy. Mem-

bers and Non Members can all access the newsletter on line, anytime. And if you have copies you no longer wish to keep, send them my way so I can start giving them out at star parties. Print your copy, use it until it is no longer needed, then donate it to the club by adding it to the handouts table. Just leave it there. Someone will take it, or we will use it at a future star party. And if you have your name and address on it, such as a Member would if they were receiving a hard copy, just black it out with a marker. Donated newsletters are appreciated. I'd rather you donate them, than toss them in the trash. Even old newsletters have some value... our website is listed, contact info is in it... all the needed info for someone thinking of joining PAS. Let's work together to get the word out about PAS!!!! Thank you for your newsletter donations!!!

## PAS / Bookman's Telescope Workshop Feb 21, 2010

By Terri, Event Coordinator

What an awesome afternoon! I want to thank all the PAS Members who attended to help out. I'm sorry for a little miscommunication about Carlos O'Briens, but the email about that was sent out 4 days prior to the event, and some folk didn't read it.

Anyway, the day started with rain, and the Weather Watchers watched to be sure we were able to hold the event, and then we did! This event, it was decided, would be canceled if there was falling rain at the time of the beginning of the event. A light drizzle, mist in the air, or anything else that wouldn't hurt the telescopes that are arriving for the event, would be ok. But rain is no good. It wasn't raining, so we held the event.

In attendance were Chris, Don, Ed, Bette, Bob, Joe, and Mike. Chris and Don were the teachers. Ed, Bette and Mike were the support group. Chris and I brought our laptops. Pete and his wife Sue attended with their scope. Pete has been a member for about 6+ months. He has been trying to come to an event to learn how to use his telescope, but each time, the events get canceled due to the weather. So, we successfully had a chance at showing him how wonderful his scope is. Don assisted Pete with his scope and it seemed that the assistance was appreciated.

Then there was Amy. Amy is our newest PAS member. Many congratulations go to Amy for joining PAS. She will be a great friend to know. We hope to see her at many, many PAS events. Chris and Amy talked

about her scope. And Don collimated it for her. Amy left happy.

It was a short meeting. We used to do a 3-hour session at Bookman's but with the other groups before and after us, we only have 2-hour time slots to fit into. But, it is nice being back at Bookman's. While there, I recalled that my contact for getting on the Bookman's calendar of events asked me to do a flier for the events. So, I had a little help from Bob finding some graphics to make our flier stand out. I completed all of the flier without the graphic, but when done, it will be posted in the forums, and at Bookmans. It should improve our turnout at this event. Photos for this event are in the PAS Photo Gallery on line. Thanks again to all who attended to help at this event. We hope to see you at the next one. \*\*\*

# PAS Speaker Line-up

By Terri, Event Coordinator

Have you ever wondered who we have scheduled for the presentation at the next PAS meeting? Well, if you are curious, look at the back page of the Newsletter. Each month the list on the back page gets updated. Check it out! And if you do not see any speakers listed, you might want to help me find speakers. Luckily, we have

speakers clear to October, but if you know someone you think would be a great speaker for Nov or Dec of 2010, please send their contact info my way, or make a suggestion. I like to have our speakers lined up and scheduled a year in advance. This way, I don't feel I have to beg PAS members to do the presentations we need to keep our PAS meetings flowing. So, check out that list,

right now on the back page. We have a great line-up for 2010. We hope to see you at all of the PAS meetings this year!!! For more info about the speakers, besides that provided on the back page of the newsletter, you can visit this link to get the document PAS Speaker Line-Up <http://www.pasaz.org/forums/downloads.php?do=file&id=8>. Enjoy! \*\*\*

## PAS Upcoming March 2010 Events

By Terri, Event Coordinator

**Mar 4:** We begin March with our favor ite event – the PAS Meeting. Mike Marron is our Guest Speaker. Meet in the PVCC Library at 7pm for a little socializing while we help the Speaker get set up. The meeting begins at 7:30 and continues till 9:15.. We pack up and depart by 9:30 as the Library needs to close up behind us.. Snacks and drinks will be provided. (Snack fund is requesting your donations.) We hope to see you there!

**Mar 5:** Private star party at Amberlea Elementary School from 5:30pm to 8pm. RSVP with Rod.

**Mar 6:** The next scheduled Virtual Star Party at Chris's home in Goodyear. This is a PAS Members Only event. Chris opens his home up in Goodyear at 7pm on this fine night to those PAS members who wish to do Remote Astrophotography. Bring your laptop, snacks and drinks to share, maybe a movie on DVD. The photography session begins at 7:30. RSVP is with Chris and is required. This event will be cancelled if there are no PAS RSVP's

**Mar 7:** The 2nd Bookman's Telescope Workshop in 2010. We meet at Bookman's on 19th Ave and Northern from 3:30 – 5:30pm. We assist the public and other PAS members

who wish to learn how to use their telescope. If it is pouring rain, this event is canceled. If it is a light rain, we are ok to hold the event. If no public RSVP's or shows up, we hold a mini MOM. RSVP is with Terri for this event. There are many more of these events scheduled for 2010. Watch for them and come join the fun. Info about telescopes, accessories, and more will be available at this workshop. Bring the family. Bookman's is a nice store for used books. The whole family can find something to enjoy while you learn about telescopes. If kids 12 and under are attending, please RSVP their attendance with Terri, and we will be sure to bring Kids Corner. It's a box with crayons, etc, to entertain the kids with astronomy activities. If there are no RSVP's for kids, Kids Corner is not provided.

**Mar 11:** PVCC is the location, starting in G-147. Join PAS as we host another fun-filled Telescope Workshop. In G-147 you learn to use your telescope by daylight. Then, take your scope outdoors, with the same PAS instructor, and learn to use it by night. RSVP is required with Terri. Various informational handouts will be available. Weather permitting, other telescopes may be available to have a mini star party at which you can learn more about telescopes. No Public RSVP's or Rain will cancel this event. Event begins at 6pm

and goes to 10pm.

**Mar 13:** We have 2 exciting events this evening. CEO is from sundown to whenever. For the CEO star party, you must RSVP with Chris and arrive at the Cuttin' Edge Observatory prior to dark. Mike is also hosting, at his home in Carefree, a star party that evening beginning at 4pm. We will have a potluck, so bring a dish and a drink to share. This event will be cancelled if there is rain or if there are no public RSVP's. The event begins at 6pm and continues till 10 pm.

**Mar 18:** PVCC Star Party 6pm to 10pm by the Telescope Domes. RSVP for this event is with Rod. See you there!

**Mar 19:** Private star party for Cub Scout Group 607 from 6pm to 8pm. RSVP is with Rod. PAS Members Only.

**Mar 25:** MEETING OF THE MINDS – This is the meeting where PAS Members discuss PAS Business stuff. We plan events, we have demos, we enjoy the evening, but mostly we discuss business that has to be taken care of with Club Member participation. This meeting is from 7pm to 10pm. If there are not enough topics to hold the meeting, we cancel it. Check with Terri prior to attending. Everyone is welcome. We encourage PAS members to attend. Location: PVCC G-147.

## The Private PAS Calendar

By Terri, Event Coordinator

Over the last several months, PAS members have asked me to create a way to receive data on NON PAS Events. So, Chris and I put together an email way of receiving event info for events that are NOT PAS Events that are happening within driving distance of Phoenix, such as Grand Canyon Star Party or the Telescope Makers Conference, etc. You need to sign up with Chris to subscribe to this mailing, which is available to PAS members only. The emails will be sent from AZAstroEvents@pasaz.org.. That email is

AZAstroEvents@pasaz.org. In the Forums, we have started a conversation about this email address with directions on how to get on the list. I've included them here:

<http://www.pasaz.org/forums/showthread.php?t=314> You send an email to our webmaster at [webmaster@pasaz.org](mailto:webmaster@pasaz.org), asking to be added to the AZAstroEvents@pasaz.org list. Put in the subject line SUBSCRIBE AZAstroEvents.

Along these same lines of thought, The Private PAS Calendar now has those events listed. My goal is to include other events that may interest our members, right there

in the Private Calendar. Take a look sometime. Open your PAS Calendar, go to the bottom right side, click on Private Calendar and it will take you to the Private Calendar of the current month. I do hope this helps a few of you in planning your attendance at the PAS events.

### A QUICK REVIEW ON HOW TO USE THE PAS CALENDAR

The PAS Calendar has 2 pages to each month. The Public calendar is set up so that the Public can see what events we have listed. When a School contacts me for setting up their star party, I send them to the

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# Gavilan Middle School Star Party

By Bob Christ

The star party at Gavilan Middle School, located in northern Phoenix (Anthem) was held on Thursday, February 18<sup>th</sup>. Located well north of Phoenix, the sky was refreshingly revealing for a Phoenix Valley event.

The school is located just south of Daisy Mountain, and a mountain range to the south effectively blocked the Phoenix light dome. Toward the end of the evening wispy clouds rolled in, but the fact that the event was held at all was a coup, especially when considering the horrible weather patterns that have plagued our planned star party events for months.

An ambitious number of 600 attendees were expected, and the actual number was around 100 or so folks, including students, parents, and young ones. A competing event (big basketball game) evidently siphoned off some number of attendees.

We provided those that attended with excellent views of objects including: a 22% illuminated Moon, Mars, the Pleiades, the Orion Nebula, the Andromeda Galaxy, and the Double Cluster. The Winter Hexagon was well-positioned and was fun to describe. Oooohs and aaahs abounded. The parents attending the event were particularly engaged and asked as many questions as their children.

As always, events such as these are wonderful opportunities to provide accurate information to reset incorrect sky-related knowledge. The provision of misinformation is all-too-prevalent (especially through the press) and Tim had three students and two parents inquire where we "blew up the Moon." He correct-

ly edified them by relating we didn't – it was aliens.

Five PAS members supported this event. Mike Marron displayed and described his meteorites, Tim Jones "dual-ported" by manning his telescope and a large binocular setup, Rod Sutter showed sky objects using his scope and laser pointer, and Don Boyd and I manned our telescopes. Whereas Rod and I brought step ladders to assist shorter viewers, Don has a unique approach. He simply turns his reflector scope in its rings to raise/lower the position of the eyepiece. It works.

A nice host, a co-operative sky, and engaged attendees resulted in a fulfilling evening.

By Rod, President

Even with a late arrival, it was just starting to get dark enough at the Gavilan Peak Elementary School to start our viewing. There were around 100 guests at the party. Tim, Robert and Don, were already set up, Mike had just arrived before I did and was getting set up. I got set up quickly and started the viewing almost immediately. I started out with Mars since it was not dark enough for deep sky objects yet. We had some good views of Mars, then I moved to M-31. I could see Andromeda through my finder, which shows you how good the sky was just after the storm on Wednesday. The storm helped clear out the air, good views even if it was only in Anthem. So after M-31, I put in a 2" wide field eyepiece and we viewed M-45. Some of the teachers and kids could not believe they could only see 5-6 stars but we could see almost 150 in the telescope. So after viewing M-45, I moved to M-42, the Orion Nebula, and got a lot of "wow's" and cool

remarks... with the view of Orion Nebula. Just after the last children were done viewing M-42, I noticed clouds moving in from the SW. Sure enough, not more than ten minutes later, by 8:30-8:45 we lost all seeing. So by the end of the night we were again looking at the clouds looking at the clouds, but all in all it was a good early show.

By Tim Jones

As astronomers, scientists, and adults, we should pay very close attention to the words we use to represent events and items - regardless of whether we're speaking to adults or kids.

Early in the event at Gavilan Peak I had three different kids and two adults ask me if we could see where they "blew up the moon." After probing to determine the seriousness of the question, I determined that the only knowledge that these folks had of the Lunar water impact event was the less-than-thorough coverage provided by the Valley news teams.

I took a few moments and explained what really happened and why we couldn't see the impact crater. Two of the kids and both adults were actually disappointed. The third child (the youngest of the three) very quickly shifted his attention to the wonder of water actually being located.

The moral of the story is that we should always communicate in a serious way when it comes to our hobby, so that we don't send impressionable listeners away with an incorrect idea of what we were really talking about.

The event was a huge success--Thanks for everything. Shannon Harshman, organizer of the event

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## The Private PAS Calendar

calendar and ask that they pick a date that does not have another event on it, especially another school. This has been working well. Also, ALL PAS Public and Private events are on the Public calendar, however the Private events have very few details listed and I provide the link to the Private Calendar so that it is easier for PAS members to RSVP.

The Private Calendar has events that are not open to the public. The Private Calendar also NOW has the NON PAS Events that are within driving distance. For instance, Jerry's Rocket Launches. They aren't PAS events, so we don't list them on

the Public Calendar. I can because it is a public event, but it is NOT a PAS Event. So, it is listed in the Private Calendar so that PAS members may see when it is. Other events, such as the Grand Canyon Star Party can also be found in the Private Calendar. I wanted to bring this to your attention so that if you see an event coming up that did not make it into the Private Calendar and should have... any astronomy event that is not hosted by PAS, then send me that data so I may include it for those PAS members who may wish to attend. For a list of NON PAS Events that have been added to the PAS Calendar, please follow

this link: <http://www.pasaz.org/forums/downloads.php?do=file&id=126>. This document will update as more events are added or changed.

I do hope this clears up any confusion you may have had over which calendar you should visit. Always RSVP in the calendar or in the forums where the discussion for that event is taking place. If it is a Private Event, the Private Forums have the data about that event. If it is a Public Event, such as Bookman's Telescope Workshop, then it is in the Public Forums for all to read and interact with. Thanks for taking a moment to review with me. \*\*\*

# Arizona Sky



By Leah Sapir

Orion is still prominent in the western sky this month. Certainly the most famous nebula in Orion is M42, the Great Orion Nebula – but there is so much more to see here! M42, with a diameter of about 40 light years, is in the center of an enormous cloud of dust and gas, several hundred light years in size, known as the Orion Molecular Cloud. But the cloud is mostly dark and invisible to us, except for parts of it that are lit up here and there by bright stars. Fortunately, though, there are many of those.

Orion's belt is a lovely region to explore, particularly around the star Alnitak, the leftmost star in the belt. Alnitak is a type-O blue supergiant, with about 20 times the sun's mass, and 10,000 times the sun's luminosity. And, it is a double star: its companion is a type-B blue star with 14 times the sun's mass. The two stars are about 600 a.u. apart (.01 light year, or about 20 times the distance of Neptune from the sun). It takes a few thousand years for the pair to orbit each other.

South of Alnitak is the famous Horsehead Nebula, a dark cloud with an interesting shape, seen against the background of the bright nebula IC 434. A few bright spots can be seen in the dark Horsehead. These are young stars in the process of formation. Within the nebula, streams of gas are being sculpted by strong magnetic fields.

The Horsehead was first observed by Williamina Fleming in a photograph that she analyzed for the Harvard Observatory in 1888. Later, E. E. Barnard catalogued it as B33 in his list of dark nebulae. Barnard was the first to determine that dark nebulae are not an absence of stars, but dense dark objects that block the light of the stars behind them.

IC 434, the bright nebula behind the Horsehead, is illuminated by the nearby star Sigma Orionis. Sigma is actually a 5-star system, where the two brightest stars are a type-O and type-B giant, with masses of 18 and 14 times the sun's mass, respectively. The two stars are about 90 a.u. apart, and orbit each other every 170 years. Ultraviolet light from these stars ionizes the gas

cloud and makes it glow.

In the wide-field photo shown here, IC 434 is the long red strip behind the Horsehead, with Alnitak at the left (north) and Sigma Orionis at the top (west).

Scattered over the picture are beautiful reflection nebulae, where bright stars illuminate the nearby dust clouds, but aren't strong enough or close enough to ionize them. The reflection nebulae appear blue because blue light waves are the ones most easily scattered by the dust particles, due to the size of the particles relative to the various wavelengths of light. The nebula slightly below the Horsehead is NGC 2023, and the smaller one at the bottom of the picture is IC 435. Left of Alnitak are IC 431 (partially cut off by the edge of the picture) and IC 432.

East of Alnitak (and seen below it in the picture) is another beautiful nebula complex, NGC 2024 – also known as the "Flame Nebula" due to its shape. This nebula is illuminated by Alnitak itself. Here, too, the bright ionized gas glows in red, and the dark lanes are thicker masses of dust that hide parts of the bright nebula.

About 2 degrees northeast of Alnitak is a beautiful group of reflection nebulae. The main nebula is M78, and the other bits and pieces of nebulosity are actually parts of the same cloud. The dark nebula LDN 1630 – an extension of B33 – winds through the

complex and hides parts of it from our view.

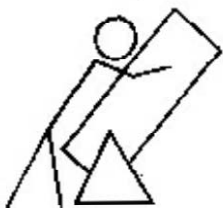
In this picture, M78 is the large fan-shaped nebula at the center. NGC 2068 and NGC 2064 are the fainter nebulae slightly above it (west), and NGC 2071 is at the left (north).



Horsehead Nebula close-up, photographed by Joshua Hufford



Wide field view of the Horsehead and Flame Nebulae, photographed by Joshua Hufford



# Arizona Sky

M78 was discovered by Pierre Mechain in 1780, and was added to Charles Messier's catalog soon after. NGC 2071 was discovered by William Herschel in 1786, and NGC 2064 and 2068 were discovered by other astronomers in the 19th century.

In 1919, Vesto Slipher of the Lowell Observatory in Flagstaff photographed the spectra of nebulae in Orion, and he noticed that while M42 had specific emissions lines corresponding to ionized hydrogen, M78 had a continuous spectrum very similar to stars HD 38563A and 38563B, the pair of bright type-B stars seen within the nebula at its northwest edge. He correctly deduced that M78 was not producing its own light, but simply reflecting light from these stars.

M78 is about 4 light years across, and contains about 45 "T Tauri" stars (variable stars that are apparently young stars in the process of formation) and at least 17 Herbig Haro objects (young stars ejecting jets of matter). Two Herbig Haro objects, HH 24 and HH26, can be seen near the top right corner of the picture.

And between M78 and the pair of HH objects is a tiny pink nebula with an interesting history.

In January 2004, an amateur astronomer named Jay McNeil was observing this area from his home in Kentucky, and he found what seemed to be a new nebula! Further research showed that although the nebula was not seen in photos taken a few months earlier, or in several photos of the Digital Sky Survey taken between 1951 and 1991, it could be identified in other previous images, such as a picture taken in 1966. Therefore, "McNeil's Nebula" is now recognized as a variable rather than "new"

nebula. But whether "variable" or "new", it is a tribute to the skill of amateur astronomers, who can still make independent discoveries with home equipment.

Here in the solar system, Mars is no longer at opposition, but still very bright, and still up for most of the night. Saturn is now at opposition, though, and will be up from dusk to dawn. Mercury disappeared into the sunrise last month, but it will reappear as an evening star towards the end of the month. In fact, late March and early April will be a good opportunity to view the elusive Mercury.

Venus is rising into the twilight, and the viewing will get better towards the end of the month. Jupiter and Neptune will be reappearing as morning stars towards the

end of the month, but Uranus will be too close to the sun for viewing this month.

Mars and the Beehive cluster will be travelling together across the sky for most of the month, and the first-quarter moon will join them on March 25 and 26. On March 1-2, Saturn will be near the full moon all night from east to west. Venus and the crescent moon will be visible together low in the west after sunset on March 16 and 17. And on March 20, the moon will be near the Pleiades till around midnight.

Join us next month when we will explore the spring constellations. And till then – wishing you clear skies, and happy observing!



M78 and other reflection nebulae, photographed by Leonardo Orazi.

## New Entry on Space Place "Mission Chronicles" Blog

Received from NASA Space Place via Email Sometimes scientists who work on things like Einstein's theory of general relativity and the properties of spacetime seem a breed unto themselves. But, as Michele (mi-KAY-lee) Vallisneri explains in his

new Mission Chronicles blog entry on The Space Place, such scientists are just very curious individuals eager to figure out how the universe really works. He explains the LISA mission to detect the gravitational waves predicted by Einstein's theories and

what it's like to work with this passionate team of spacecraft and mission designers, engineers, and scientists. Check out his story at <http://spaceplace.nasa.gov/en/educators/mission-chronicles>.

## Pizza

By Terri, Event Coordinator  
Many many thanks to Joe and Renee, our newest PAS members, not only for joining

PAS but also for providing the awesome pizza that was enjoyed at the February PAS meeting! It was such a nice treat to have

plenty to munch on during the meeting. Thank you so very much Joe and Renee. \*\*\*





## Flipping the Lights on Cosmic Darkness

Exploring the universe is a bit like groping around a dark room. Aside from the occasional pinprick of starlight, most objects lurk in pitch darkness. But with the recent launch of the largest-ever infrared space telescope, it's like someone walked into the room and flipped on the lights.

Suddenly, those dark spaces between stars don't appear quite so empty. Reflected in the Herschel Space Observatory's 3.5-meter primary mirror, astronomers can now see colder, darker celestial objects than ever before—from the faint outer arms of distant galaxies to the stealthy “dark asteroids” of our own solar system.

Many celestial objects are too cold to emit visible light, but they do shine at much longer infrared wavelengths. And Herschel can observe much longer infrared wavelengths than any space telescope before (up to 672 microns). Herschel also has 16 times the collecting area, and hence 16 times better resolution, than previous infrared space telescopes. That lets it resolve details with unprecedented clarity. Together, these abilities open a new window onto the universe.

“The sky looks much more crowded when you look in infrared wavelengths,” says George Helou, director of the NASA Herschel Science Center at Caltech. “We can't observe the infrared universe from the ground because our atmosphere blocks infrared light, and emits infrared itself. Once you get above the atmosphere, all of this goes away and suddenly you can look without obstruction.”

Herschel launched in May from the Guiana Space Centre in French Guiana aboard a European Space Agency Ariane 5 rocket. Since then, it has expanded the number of distant galaxies observed at far infrared wavelengths from a few hundred to more than 28,000. And with the instrument testing and system check-out phases finally completed, the

discoveries are only now beginning.

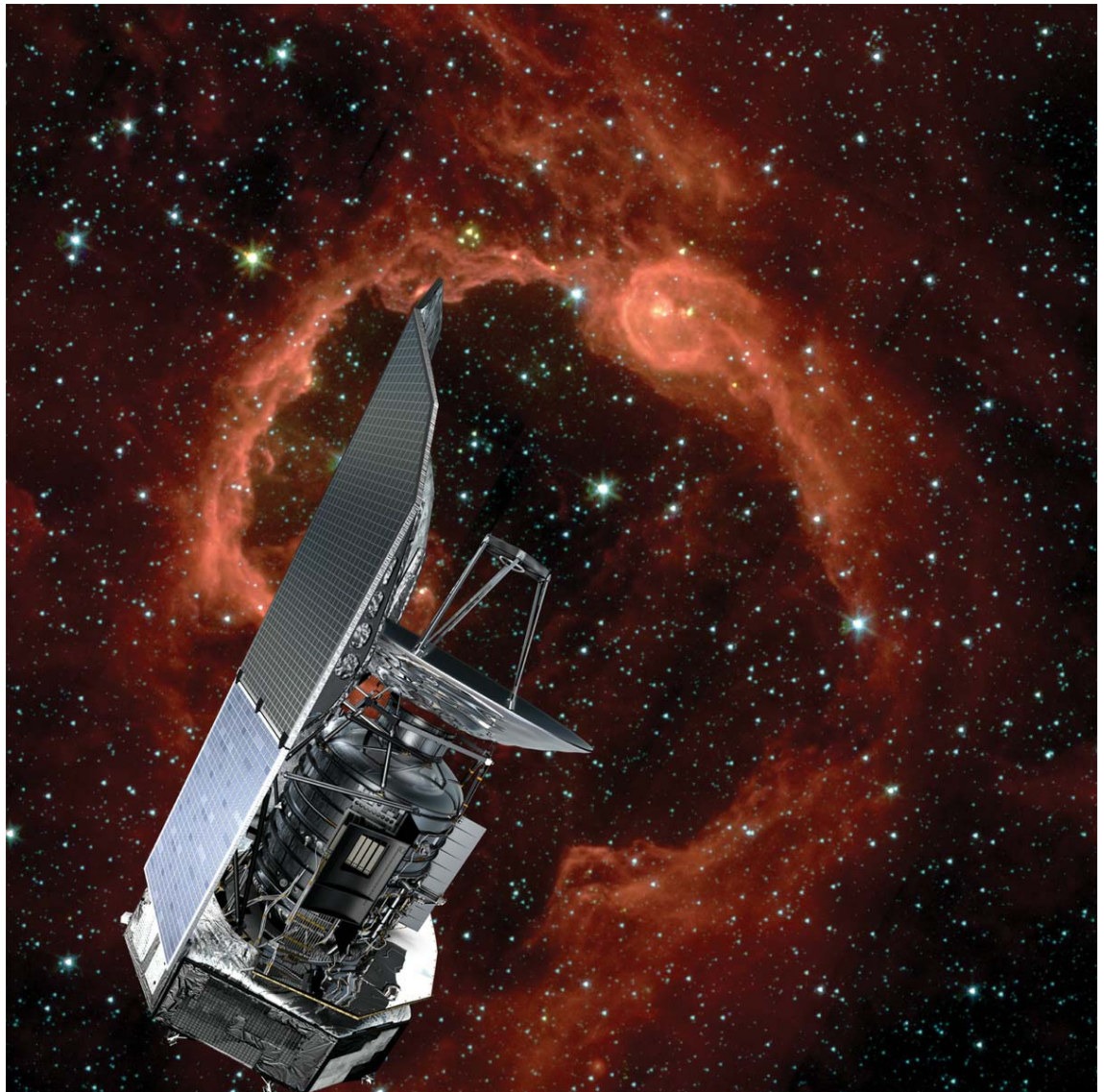
Beyond simply imaging these dark objects, Herschel can identify the presence of chemicals such as carbon monoxide and water based on their spectral fingerprints. “We will be able to decipher the chemistry of what's going on during the beginnings of star formation, in the discs of dust and gas that form planets, and in the lingering aftermath of stellar explosions,” Helou says.

And those are just the expected things. Who knows what *unexpected* discoveries may come from “flipping on the lights?” Helou says “we can't wait to find out.”

Herschel is a European Space Agency mission, with science instruments provided by a consortium of European-led institutes and with important participation by NASA.

See the ESA Herschel site at [sci.esa.int/science-e/www/area/index.cfm?fareaid=16](http://sci.esa.int/science-e/www/area/index.cfm?fareaid=16). Also, see the NASA sites at [herchel.jpl.nasa.gov](http://herchel.jpl.nasa.gov), [www.herschel.caltech.edu](http://www.herschel.caltech.edu), and [www.nasa.gov/mission\\_pages/herschel](http://www.nasa.gov/mission_pages/herschel). Kids can learn about infrared light by browsing through the Infrared Photo Album at The Space Place, [spaceplace.nasa.gov/en/kids/sirtf1/sirtf\\_action.shtml](http://spaceplace.nasa.gov/en/kids/sirtf1/sirtf_action.shtml).

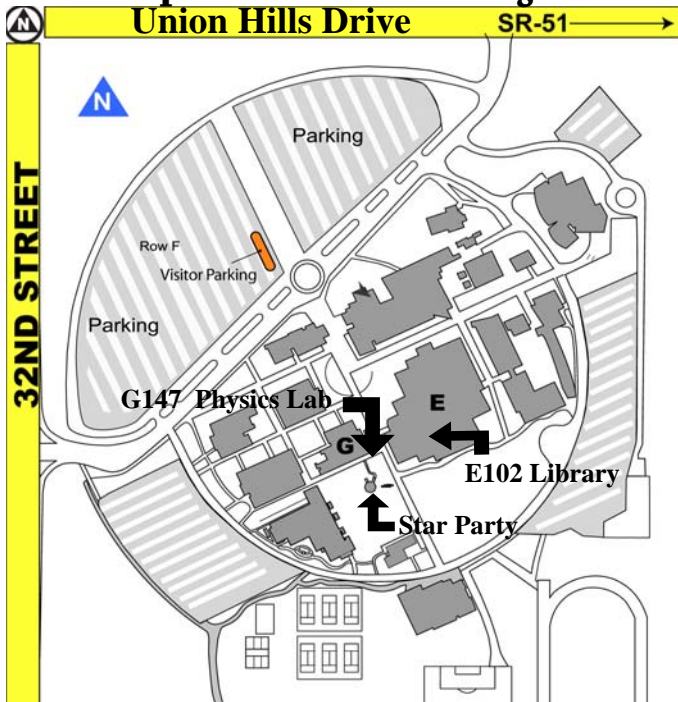
*This article was provided courtesy of the Jet Propulsion Laboratory, California Institute of Technology, under a contract with the National Aeronautics and Space Administration.*



*The Herschel Space Observatory has 3.5-meter primary mirror, allowing astronomers to see colder, darker celestial objects than ever before.*



# Map to PAS Meeting



# Wigwam Creek School Star Party Rescheduled

By Terri, Event Coordinator

The Wigwam school star party was scheduled for Feb 20, but due to a nice rain storm, we had to cancel the event. Eric, my contact there at Wigwam school, wasn't very happy that the rain took away the event he and have been planning since August 2009. So, I put out the word that we were moving it to April 17. If you can assist, we'd love to have you! Thanks! RSVP today! \*\*\*

See page 4 for more information

## March

Sun	Mon	Tue	Wed	Thu	Fri	Sat
	1	2	3	4 PAS Meeting	5 Amberlea School	6 VSP
7 Bookman's Telescope Workshop	8	9	10	11 PVCC Telescope Workshop	12	13 CEO Star Party/Potluck
14	15	16	17	18 PVCC Star Party	19 Cub Scout Star Party	20
21	22	23	24	25 MOM	26	27
28	29	30	31			

## Ads in PAStimes

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

By Terri, Event Coordinator

2010

Mar 4: Mike Marron "Exploiting Space"

Apr 1: Klaus Brasch "Astro-imaging Adventures in Chile"

May 5: Chris Johnson "Astrophotography"

June 3: Dave Hellman Topic: TBA

Sep 2: David Williams Topic: TBA

Oct 7: Jenny Neureuther Topic: TBA

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## What's Up For March?

By Rod Sutter, PAS President

### Planets

Name	Date	Rise	Set
Mercury	03-1-09	06:32	17:28
Venus	03-1-09	07:31	19:15
Mars	03-1-09	14:54	05:05
Jupiter	03-1-09	06:54	18:14
Saturn	03-1-09	19:54	08:04
Uranus	03-1-09	07:39	19:31
Neptune	03-1-09	06:13	17:08
Pluto	03-1-09	02:51	13:18

All Times Arizona Time

March 15 2009

**Sunrise: 06:12**

**Sunset: 18:42**



**Full: February 28**



**Q3: March 7**



**New: March 15**



**Q1: March 23**