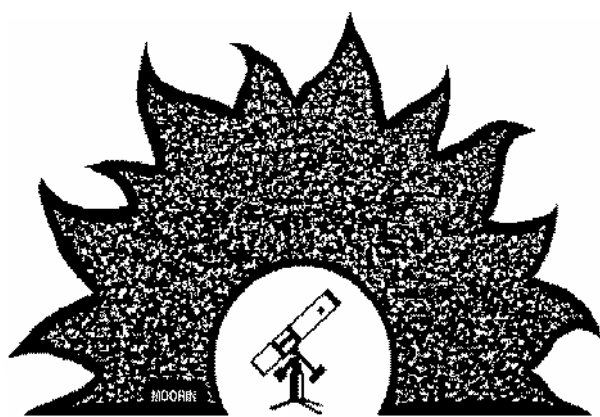




PAStimes

Phoenix Astronomical Society
www.pasaz.org

April 2009
Volume 60 Issue 8

PHOENIX ASTRONOMICAL SOCIETY — ESTABLISHED 1948

Ken Herkenhoff to be April 2 Speaker

Ken Herkenhoff is the Payload Element Lead for the Microscopic Imagers on the Mars Exploration Rovers. Herkenhoff has been a geologist with the USGS in Flagstaff since 1998 and before that was research scientist with JPL. The title of his talk form PAS is "CCD imaging from the Mars Exploration Rovers."

We asked Herkenhoff for a brief paragraph about his talk and we received this in response.

"The U.S. Geological Survey's Astrogeology Team in Flagstaff has been heavily involved in the design, calibration, and operation of the cameras on NASA's Mars Exploration Rovers. The targets viewed by the MER cameras range from grains of sand to the Sun and Martian moons. The

Mars Exploration Rovers (MER) continue to explore Mars more than 5 years after 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.

Geologist Ken Herkenhoff will give an overview of the missions and highlight results from the cameras."



We look forward to this and hope to have a good audience for this talk.

As usual the meeting starts at 7:00 with the talk starting at 7:30...see you there.

April PAS Upcoming Events

By Terri, Event Coordinator

This is a surprising month. Usually the weather warms up & school are calling us like crazy to get their star party in before the end of the school year. But, for some reason, we have NO star parties with schools scheduled at the time of writing this article for the newsletter on 3/17.

4/2: We start the month with the wonderful PAS meeting. We have an awesome speaker for this month in which Ken will tell us about imaging & the Mars Rover. This should be exciting & informative. Bring snacks to share. Water & a few snacks will be provided by PAS this time. Here is some more info about our Guest Speaker:

<http://astrogeology.usgs.gov/About/People/KenHerkenhoff/>

REMEMBER: April 2 - 5 is 100 Hours of Astronomy. It is possible that PAS will schedule some events during this time so watch the calendar on line.

4/9: Volunteers are needed for a PVCC star party. RSVP will be with Rod. Everyone is welcome... bring the whole family.

4/30: This will be our Meeting of the Minds. Currently, as of writing this article, we have the following topics: 1) Guest Speaker – PAS Cover Hotel for night? + \$50 or Gas Down from Sierra Vista – Bob Gent Webpage, 2) PAS Post Card project – discussion – possibly make phone calls?

Divide up list. 29 on list. 3) 5/2 Astronomy Day - Schedule an event? 4) Tim: Membership Drive ideas

More ideas are welcome and needed. And into May 2009:

5/1: Sunset Ridge - this is the rescheduled of the April event. The weather got the best of us, so we are attempting this date. Volunteers are needed. This is the star party where they serve us pizza and drinks, and we share in the tips collected. PAS Members get in on the tips. RSVP is required with Terri.

5/7: PAS Meeting:

Sonny Schug - "History of Astrophotography"***

President / Librarian	Rod Sutter	602-971-9129	President@pasaz.org
Vice President / Events Coordinator	Terri Finch	602-561-5398	VicePresident@pasaz.org
Treasurer	Mike Marron	480-488-3031	Treasurer@pasaz.org
Newsletter Editor	Don Boyd	480-963-7189	Editor@pasaz.org
PAS Host	John Pulis	623-570-5308	
Webmaster	Chris Johnson		Webmaster@pasaz.org
WOW Contact	Chet Schuler	480-272-4545	chetsch@cox.net
Rocketry Liaison	Jerry Belcher	623-328-9290	http://ahpra.org/launches.html

March 5, 2009 Pas Meeting Review

By Terri, Event Coordinator

Photos for this event can be found in the Photo Gallery on the PAS website. Enjoy!

This was a fun PAS meeting. Bob Holmes, Meteorite Man, brought many samples of meteorites for everyone to experience and enjoy. His presentation was very well laid out, even though he seemed a bit nervous. We enjoyed it! Thank you Bob! Many thanks goes to the snack folks. Sandra brought the most awesome cookies and everyone was asking her where she got them. She decided to keep it a secret and said she'd treat us to the cookies again when she attends a PAS meeting. Sam brought the popcorn, for which I got some this time. Thank you, Sam! Ed brought more cookies, Terri brought the water. It was a wonderful, snacking time. Prior to the meeting, we had so few announcements, I think we actually started the meeting at 7:35. That's unusual. However, the announcements made are here in brief. Dave, with Rod's help, shared the info on the star party by Apache Junction that PVCC is hosting. Email's to the PAS Membership were sent out with maps and details. Dave is the RSVP for this star party on Mar 27. Chris announced his CEO cancellation for the March Mayer star party, Mar 21st. Then told us of the interesting change in schedule for the April CEO Mayer star party. The date for which it was

scheduled is being moved. Chris said the plan is to go with the week prior. If weather lets him hold the star party, he will do it then. If not, we will for the week after the original date, as a back up plan. See article about the CEO star parties in this issue for exact date change.

It was a great meeting. Thanks to everyone who made it possible. And we welcome John Pulis back to PAS. He wasn't feeling well for a long time, missed many meetings, even broke his wrist recently, but has returned to us, hopefully for a long time! ***



New on the Space Place Web Site

Why is Earth's core so hot?

Blistering hot molten rock bursts through weak places in Earth's crust. So what is down there and why is it so hot? Earth's core may seem as mysterious and remote as outer space, but scientists actually have learned a great deal about it. Listen to a scientist explain. Visit <http://spaceplace.jpl.nasa.gov/en/educators/podcast/> to subscribe to these Podcasts. Or listen now to this and the previous Podcasts on your computer or read the transcripts.

Education Outreach Coordinator
Colleen Barboza

April Cuttin' Edge Observatory - Mayer Star Parties

Written by Terri, Info provided by Chris

At the March PAS meeting, Chris announced a slight change in the April CEO star party.

The CEO star party originally falls on the new moon, which is April 25th. Chris is canceling that star party and has a back

up plan. Due to weather, he would like to give 2 dates. The first will be the week prior to the above date: April 18th. Should weather get in the way and the star party become canceled, another date will be open. The week after the 25th, which is May 2, will then be the date of this star party. So, if you plan to attend the CEO for

April, put on your calendar April 18th. RSVP with Chris. If it is canceled, the secondary date for April will be May 2, which is Astronomy Day. Most of the time in May, we do not have too many weather related cancellations. RSVP is required, especially since the star party may or may not happen on April 18th. Enjoy! ***



Apollo Upgrade

The flight computer onboard the Lunar Excursion Module, which landed on the Moon during the Apollo program, had a whopping 4 kilobytes of RAM and a 74-kilobyte "hard drive." In places, the craft's outer skin was as thin as two sheets of aluminum foil. It worked well enough for Apollo. Back then, astronauts needed to stay on the Moon for only a few days at a time. But when NASA once again sends people to the Moon starting around 2020, the plan will be much more ambitious—and the hardware is going to need a major upgrade. "Doing all the things we want to do using systems from Apollo would be very risky and perhaps not even possible," says Frank Peri, director of NASA's Exploration Technology Development Program. So the program is designing new, more capable hardware and software to meet the demands of NASA's plan to return humans to the moon. Instead of staying for just a few days, astronauts will be living on the Moon's surface for months on end. Protecting astronauts from harsh radiation at the Moon's surface for such a long

time will require much better radiation shielding than just a few layers of foil. And rather than relying on food and water brought from Earth and jettisoning urine and other wastes, new life support systems will be needed that can recycle as much water as possible, scrub carbon dioxide from the air without depending on disposable filters, and perhaps grow a steady supply of food—far more than Apollo life-support systems could handle. Next-generation lunar explorers will perform a much wider variety of scientific research, so they'll need vehicles that can carry them farther across the lunar surface. ETDP is building a new lunar rover that outclasses the Apollo-era moon buggy by carrying two astronauts in a pressurized cabin. "This vehicle is like our SUV for the Moon," Peri says. The Exploration Technology Development Program is also designing robots to help astronauts maintain their lunar outpost and perform science reconnaissance. Making the robots smart enough to take simple verbal orders from the astronauts and carry out their tasks

semi-autonomously requires vastly more powerful computer brains than those on Apollo; four kilobytes of RAM just won't cut it. The list goes on: New rockets to carry a larger lunar lander, spacesuits that can cope with abrasive moon dust, techniques for converting lunar soil into building materials or breathable oxygen. NASA's ambitions for the Moon have been upgraded.

By tapping into 21st century technology, this program will ensure that astronauts have the tools they need to turn those ambitions into reality.

Learn more about the Exploration Technology Development Program at www.nasa.gov/directorates/esmd/aboutesmd/acd/technology_dev.html. Kids can build their own Moon habitat at spaceplace.nasa.gov/en/kids/exploration/habitat.

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



The Chariot Lunar Truck is one idea for a vehicle equal to the lunar terrain. Each of the six wheels pivot in any direction, and two turrets allow the astronauts to rotate 360°.

Arizona Sky



This month the Big Dipper is high in the northern sky, with Leo directly opposite in the south. The lion's body forms a trapezoid about the same size as the Big Dipper.

Regulus marks the southwest corner of the trapezoid, and Denebola is at the southeast. A faint "backwards question mark" (or "sickle") rises from the western side, forming the lion's head. Regulus is the dot at the bottom of the question mark.

The Dipper's handle points out more constellations: "follow the arc" of the Dipper's handle to Arcturus, in Bootes; then "speed over" to Spica, in Virgo. And, nestled inside the Dipper's handle is Cor Caroli, in the constellation Canes Venatici.

We can "connect the dots" of Denebola, Spica, Arcturus and Cor Caroli to form a lovely large asterism framing the spring sky: "Virgo's Diamond".

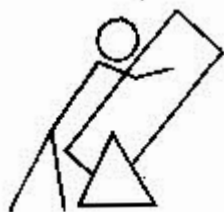
But setting our sights farther, spring is galaxy season! There are plenty of galaxies and galaxy clusters in and around the spring constellations, including quite a few from Charles Messier's "Top 110" list.

Let's start at Alkaid, the bright star at the end of the Big Dipper's handle. Imagine a line going from Alkaid to Cor Caroli. About 3 degrees away from Alkaid, a bit west (i.e. towards the Dipper's bowl) of the Alkaid-Cor Caroli line, is the Whirlpool Galaxy, M51. You'll need dark skies and binoculars or a telescope to see it, but it's a real treat.

Charles Messier discovered M51 in 1773; and in 1781, Messier's observing partner Pierre Mechain noticed that M51 was actually two fuzzy spots, not just one. Messier made a note that M51 was a "double nebula". (The second fuzzy spot, actually a companion galaxy, is known today as NGC 5195. M51 is NGC 5194.)

At that time, all deep sky objects were considered to be "nebulae". Their actual nature was unknown. With sufficient magnification, some "nebulae" could be re-

solved into stars; today we know that those are open clusters and globular clusters. But M51 was one of the "nebulae" that could not be resolved.



M51 and NGC 5195

In the mid-nineteenth century, William Parsons, 3rd Earl of Rosse, decided to build a very large telescope on his estate in Ireland: it had a 72-inch mirror and was nicknamed the "Leviathan". In 1845, while observing M51 with the "Leviathan", Lord Rosse saw for the first time that the main "nebula" of M51 had an unusual spiral structure. Within a few years, Lord Rosse had a list of about a dozen "nebulae" that exhibited spiral structure. But, the reason for this structure was still unknown. Some astronomers theorized that the "spiral nebulae" were perhaps stars where solar systems were being formed. It was assumed, of course, that all deep sky objects were located somewhere in our galaxy. The entire universe was thought to consist of... the Milky Way Galaxy.

It was only in the early 20th century that Edwin Hubble realized that the "spiral nebulae" were actually "island universes" outside our own galaxy. Today we know that M51 is about 30 million light years away. NGC 5195 is about ½ million light years farther. The two seem as if they are connected with a "bridge", but this is an optical illusion; NGC 5195 is simply located behind one of M51's spiral arms. The galaxies are not really connected, but they have had interactions in the past.

Lord Rosse's "Leviathan" had a mirror made of a metallic alloy, speculum; but modern telescopes with high-quality glass optics have much better resolution. Today we can see spiral structure in M51 with a telescope of 8-10". Larger backyard telescopes, or astrophotography techniques, can also show bright spots in the arms, where star formation is taking place – pos-

sibly a by-product of M51's recent gravitational interactions with NGC 5195.

About halfway from M51 to Cor Caroli (i.e. 5 degrees from each of them) and a little east (i.e. away from the Dipper's bowl) of the Alkaid-Cor Caroli line, is another galaxy with a picturesque name: the Sunflower Galaxy, M63. This was Pierre Mechain's first contribution to Messier's catalog, soon after he began observing in 1779. M63 is around 30 million light years away, and is probably about 3 million light years away from its neighbor, M51. In fact, the two are part of a gravitationally bound group of galaxies that also includes the fainter galaxies NGC 5023 and UGC 8320.



M63

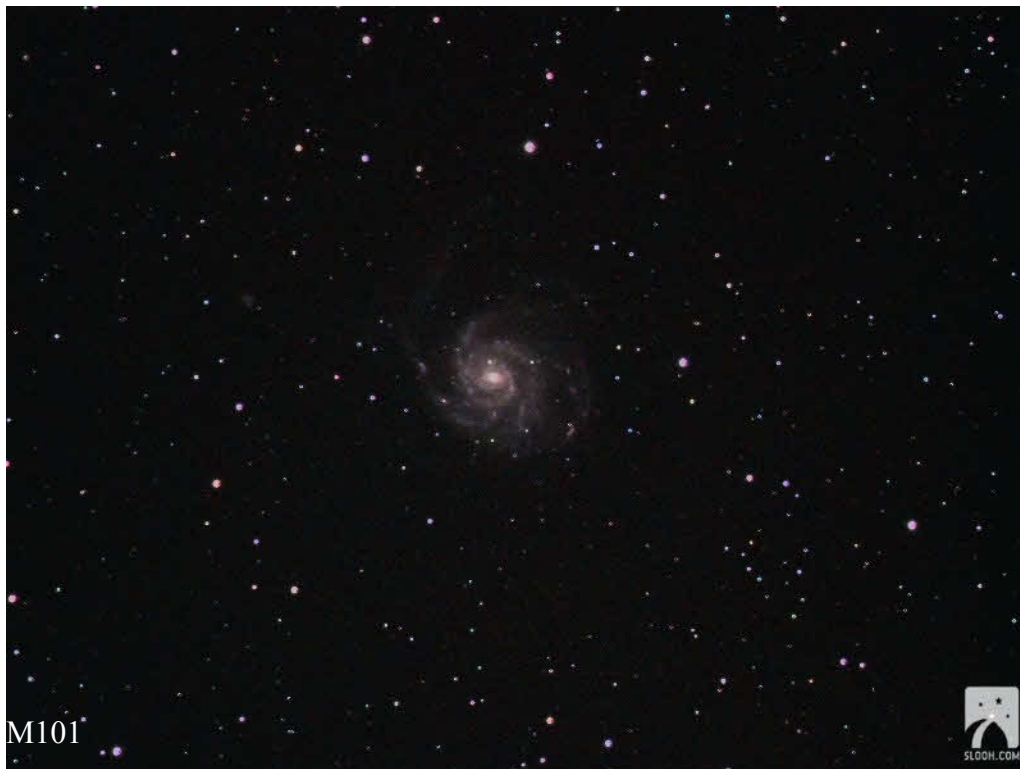
M63 is a spiral galaxy, but its arms aren't as well-defined as M51's; instead they are "fluffy" or "flocculent".

On the other side of the Big Dipper's handle is another interesting galaxy, M101, also known as the Pinwheel. (Actually, this nickname is shared with M33 in Andromeda – apparently quite a few spiral galaxies resemble pinwheels...)

M101 forms an equilateral triangle with the two "end stars" of the Dipper's handle: Alkaid and the Alcor-Mizar pair. The Pinwheel seems a little fainter than either M51 or M63, since it is more spread-out. The Whirlpool and the Sunflower are about the same diameter as the Milky Way, but the Pinwheel is twice as large. M101 was discovered by Pierre Mechain in 1781.

Some of the bright, fuzzy spots around M101 originally received separate NGC numbers, as 19th century astronomers assumed that these were separate "nebulae". But modern telescopes show that these bright spots are actually star-forming re-

Arizona Sky



gions in the spiral arms of M101. Each of these regions is composed of multiple giant molecular clouds, and has a mass of millions of suns.

M101 is about 25 million light years away, and is part of a group of at least six

gravitationally bound galaxies. Interactions among these galaxies might be the cause of the star formation that can be seen in M101.

Closer to home, this month is a good time to see the elusive Mercury in the evening! It sets close to sunset at the beginning of the month, but from midmonth onward, Mercury is up for over an hour after sunset. On April 26, the crescent moon will be near Mercury and the Pleiades – a nice photo op! Mercury will continue to approach the Pleiades from April 27 through 30, getting closer each night.

Saturn is still up all night, but beginning to set earlier – by 3:30 a.m. at the end of the month. And Jupiter is rising earlier each night: 4 a.m. at the beginning of the month, but 2 a.m. by the end of the month.

Venus and Mars are also morning stars, rising around 5 a.m. at the beginning of the month, and 4 a.m. at the end of the month. Watch Venus on the morning of April 22, when it slips behind the crescent moon at around 5 a.m.! Mars will be only around 4 degrees away.

And on this topic, the moon will appear close to Antares on the night of April 12-13, and will occult the globular cluster M4 around 3 a.m. on April 13. Now, is that a lucky morning or what?

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

Meeting of the Minds Feb 26 Review

By Terri, Event Coordinator

This was an interesting meeting. Please visit the awesome Photo Gallery on the PAS website to enjoy some photos of this event. It started with Mike, having cleaned out his closets of clothing that no longer fit him, and passing it on to Don and Frank. Frank was trying some one in the beginning of the photos online. Everyone was laughing and having an awesome time.

Then, as several members who said they were attending, weren't there by 7:30, we decided to wait until 7:40 to start the meeting. 2 of the three members showed up after we began. We first turned it over to Chris. Chris was only going to do a 15 minute presentation on an idea he had about a 1) VIRTUAL STAR PARTY, when it turned out to be about an hour long. But those who attended the meeting, learned a lot and were in on a major decision. What is a Virtual Star Party? Well, Chris's idea is this. He found a program that can control

his scope, whether it is in Goodyear at his home or his scope is up in Mayer at his observatory, remotely. This would be like Slooh, without all the expenses to belong to Slooh. So, what Chris did was show us a demo of how easy it would be to control his scope remotely. This is an awesome idea. The expense of this item would be about \$600. To recoup the cost, we were considering that those who wish to use this system would gather at either Chris's home or Chet's (in Scottsdale), because they both have similar setups. We would schedule a night or two per month to do these sessions. And those participating would be asked to make a donation to the club, per session. So, if you attended the session and were given telescope time to take photos through the mentioned scopes above, then you would donate \$5 or \$10 to PAS (the amount isn't decided yet) for how ever long it takes you to do your photography for that one night. The exact details would have to be dis-

cussed at a future Meeting of the Minds and decided upon at that time. This was more of an introduction to what we could do and could offer our members, that other clubs do not have available right now. This would also be a PAS Members Only event. And Chris was saying that we could set up an IRC/IM related chat within the Members Only section of the website, so that we could schedule the photography sessions. What you would come away with at the end of the night, is a set of photos, of some object, or several if only a few people were interested in that night, in which you could then take home and process through programs that sandwich astro photos, or Chris has offered to do the end photo for you, and/or we could hold a training class once every couple months to show you how to sandwich and make your photos awesome. You would be the owner of those photos, you took them, they are your astro photos. This is a very exciting item and idea. But,

we can't do it until we have approval from the membership to spend the money on the program needed to assist us. And, last night, the turnout of the group attending wasn't as large as it should have been for a major decision like this. So, we will probably hold a MOM's in which we will vote on the possibility of purchasing it, and Chris could do a mini demo again for those who missed it. Now, if it interests you to be able to take high quality, professional photos of objects in space, then you will want to attend that meeting. It isn't scheduled yet, but I will keep you informed of when it is so that we can make a good decision as to spend the money on this kind of item or not. Watch for more info on this subject in the forums and the newsletter.

After Chris finished his presentation, there wasn't much time to talk about items on the Agenda, so we skimmed a few of them, quickly. The next item we turned over to Don. Don had seen in the Tucson Astro Club's newsletter that they are part of a thing through grocery stores called 2) Shop & Give. So, he presented his idea to the membership and we had a very good discussion about it. The stores who do this are Bashes, Safeway, Sweet Tomatoes... and others. Someone mentioned checking out Walmart and Target. It is up in the air as to if we are doing it. What we were seeking is finding someone to volunteer to keep the records and contact the stores, and just be the Liaison between the stores and PAS. No one took the position. If you are interested in the position, contact Don or Terri.

Then we had an update from our Treasury. I originally asked Mike to bring the most recent statement with him from the bank so that we could discuss the possibility of one of my topics... a \$200 purchase, see below (PAS Patches)... but it turns out we needed this info for the idea of purchasing the \$600 program Chris was sharing with us. The PAS Treasury has about \$11,688.05 in it currently. When asked, Mike said that last year, the dues collected broke even with the expenses the club had. Remember, your dues don't just cover the newsletter, which if you get it electronically only costs the club the amount needed to print 5+ for those who do not get it electronically. Your dues cover the Club Insurance, the membership to Astronomical League which gives us an amazing discount on the insurance, we found out, and the payment to Guest Speakers. The Speakers who come from out side of Phoenix currently get \$50 for gas. That would be Tucson, Flagstaff, Sedona. So, everytime we have an out of Phoenix speaker, it costs the club to do so. Our next

speaker who is out of town is scheduled for Apr 2, and he's requested \$84 to have him come talk to the club. The members approved this a few months ago. So, don't go thinking the club doesn't have expenses, oh and it costs to stay Incorporated. I'm sure there are other expenses as well, I just don't have a list handy. Maybe for a Meeting of the Minds we can get Mike to make a list of what money goes where in a year, so everyone has an idea where the expenses go.

Then the night flowed very quickly, with only 20 minutes to cover the rest of the topics, here are the results of those topics: No one = those in attendance the night of this meeting - 3) June 19-20 a star party in Sierra Vista, falls also on the Grand Canyon star party, thus no one is interested in attending at this time. - 4) Guest Speaker from out of town, down from Sierra Vista wants to be put up for the night, this topic will carry to next MOM, as it wasn't sufficiently discussed, leaning towards not having speaker due to costs - 5) Selling Webspace for ads, it was agreed upon that no one may put ads on our website that aren't astronomy related, and if they do, they just offer lots of money to do so, because we'd like to keep our site ad free, or make money offering space: like \$5000 an ad would be acceptable. - 6) PAS Patches - this also was a topic that wasn't finished. Most said NO, but if you'd like to read up on what we were discussing, go to the forums at:

<http://www.pasaz.org/forums/showthread.php?t=199>. - 7) 10/1 Dan's topic - Weightlessness won the vote. A secondary was chosen and I will schedule that with Dan at a later time. - 8) Prismatic Stickers - agreed to use Club member's photos and give them credit. Now need to collect photos for that purpose. - 9) 500+ Judges needed - was sent out in an email, no responses in email so brought it up at meeting, no one there wanted to do it. - 10) Evac's Club list, it was decided I would be the main receiver of email from that list, and then Chris would invent a special list on our server for which I could post NON PAS events from around AZ into, for those interested in knowing what was coming up, like the Grand Canyon Star party, or the Sierra Vista star party mentioned above, etc.... Watch for an announcement on this email address where you can sign up to get that kind of info, besides on the PAS Blog. - 11) Solar Weekend Mar 21-22, it was decided that since ASC wasn't asking us personally, after the fallout we had with them, and because EVAC and SAC already are helping them, that we would NOT participate in their

Solar Weekend this year. - 12) 3 Books donated by Springer: Three books came to me for review and discussion. I posted in the forums

<http://www.pasaz.org/forums/showthread.php?p=430#post430> the discussion and what we are doing with these three books. Please see forums to find out how you can get in on the book discussion. Thanks. - 13) Post Card Project: An updated list and what we know so far from the post cards we sent out to resorts, is on line at:

<http://www.pasaz.org/forums/downloads.php?do=file&id=98> Feel free to read up on this topic in the forums: <http://www.pasaz.org/forums/showthread.php?t=187> - 14) Mar 28 Messier Marathon - Idea to have event at PV Park, since it is so close to event with Boy Scout Space Derby, was canceled.

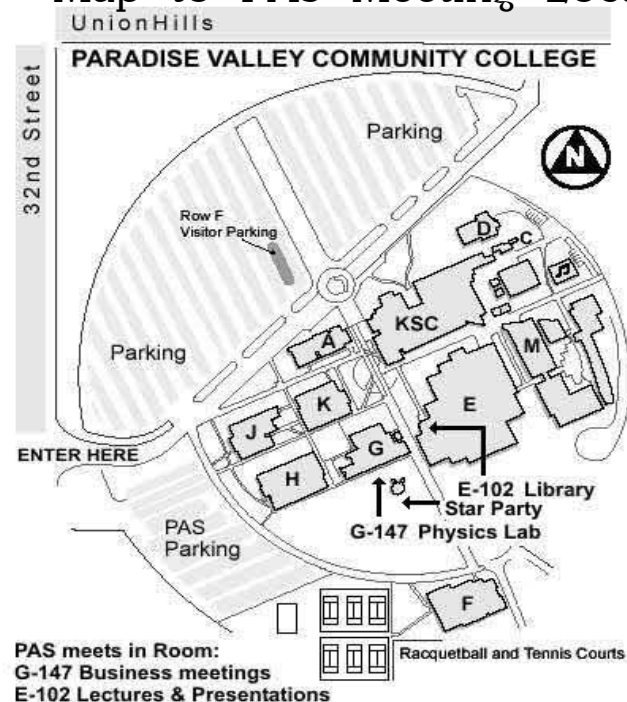
During the meeting a card was sent around to be signed by everyone attending letting Bobby McGehee know we were thinking of him. He wrote me an email saying that he can not longer attend the PAS meetings because of the oxygen tether he must stay on 24/7. The oxygen can only holds about 5 hours of supply and it takes 1.25 hrs from Sun City West to drive to our meeting location and back, plus the 3 hours of meeting time, which exceeds the 5 hours of supply and so it is out of his comfort zone to make the trip. He wishes all of us well and thanks us for welcoming him to the club for the few years he was a PAS Member. So, we sent him a PAS IS THINKING OF YOU card last night.

2 topics were not covered this night. 1) Nominations for Awards from NSN - will take care of that next MOM. 2) new project from NSN - Making Comets, for which I am seen in the photos on line, wearing the comet making attire they sent our way for this purpose.

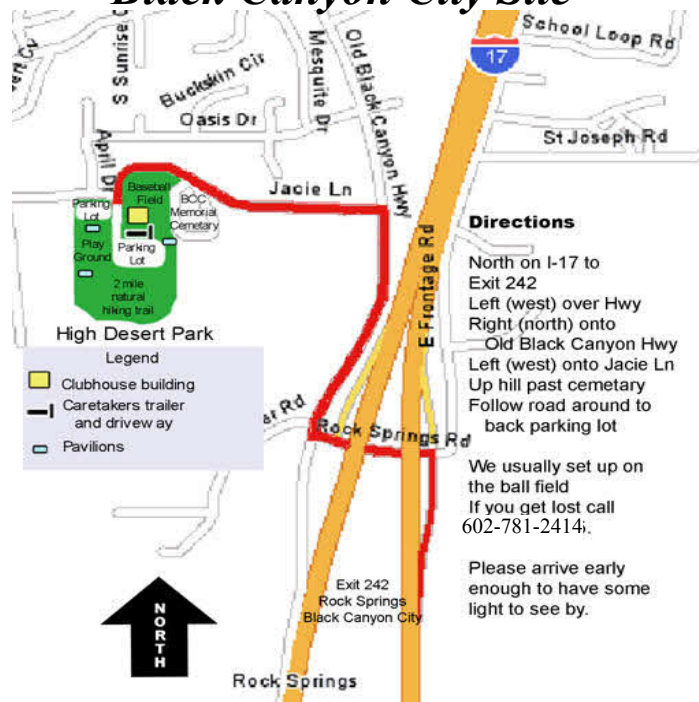
Please be sure to visit the Meeting of the Minds Agenda, for which links to forum discussions and other things will be added to the agenda so that those attending the MOM's can make good quick decisions without a lot of review prior to the decision being made. This is something new I decided to start doing so that everyone can read up on it prior to the meeting and know what we are talking about. The link for the MOM Agenda is

<http://www.pasaz.org/forums/downloads.php?do=file&id=60>. See you at the next meeting. ***

Map to PAS Meeting Location



Black Canyon City Site



April 2009

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
			1	2 PAS General Monthly Meeting	3	4
5	6	7	8	9 PVCC Star Party by Telescope Dome	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30 PAS MEETING OF THE MINDS (Business Meeting)		

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 Editor who will forward them to the Treasurer.

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

To:
{MM:First Name} {MM>Last Name}
{MM:Address Line 1}
{MM:City} {MM:State} {MM:ZIP
Code}

PAS is incorporated in the state of Arizona as a non-profit, scientific and educational 501(c)(3) organization. Our newsletter PASTimes is published monthly from September to May and distributed by US PS and the Internet. All Issues are available for download on our website www.pasaz.org Ads for astronomy equipment are provided as a courtesy to sellers and buyers, and do not constitute any endorsement by PAS. All Photos by Don Boyd unless otherwise credited. All articles and photos are copyright their authors or PASTimes.

What’s Up For April?

By Rod Sutter, PAS President

Planets

Name	Date	Rise	Set
Mercury	04-1-09	06:26	18:56
Venus	04-1-09	05:30	18:12
Mars	04-1-09	05:08	16:32
Jupiter	04-1-09	03:56	14:35
Saturn	05-1-09	13:38	05:21
Uranus	04-1-09	05:35	17:23
Neptune	04-1-09	04:12	15:03
Pluto	04-1-09	00:44	11:11

All Times Arizona Time

April 15 2009

Sunrise: 05:58
Sunset: 18:57



New: March 26



Q1: April 2



Full: April 9



Q3: April 17