

PAStimes

Phoenix Astronomical Society
www.pasaz.org

October 2011
Volume 63 Issue 2

PHOENIX ASTRONOMICAL SOCIETY — ESTABLISHED 1948

Dolores Hill to Speak at PAS October Meeting

Edited for newsletter from info provided by Dolores Hill

Last May we looked forward to hearing a presentation on "Meteorites: Keys to Understanding the Solar System" by Dolores Hill. Dolores is a meteoricist at the Lunar and Planetary Lab of the University of Arizona in Tucson. Our guest speaker in April had been Dolores's husband, Rik Hill, who had told us about his studies of Near Earth Asteroids; and Dolores was all set to speak to us on May 5 about the fascinating clues that meteorites reveal regarding the formation and evolution of the Solar System.

But on May 3 we got a sudden call from Dolores: she would not be able to speak to us on May 5 because Rik was not feeling well, and she would need to take him to the doctor. Fortunately Mike Marron and Chet Schuler agreed to fill in as guest speakers for that date, so PAS members were able to enjoy an interesting substitute presentation. Chet spoke about "Filters, Color Cameras, and Light Pollution", and Mike told us about "The Story behind the Meteorites".

In the meantime, Dolores's presentation was rescheduled for October 6, and renamed "Touchy Feely Meteorites". Meteorites include a surprising variety of types from different parent bodies and ages. Samples in the world's meteorite collections

include both primitive cometary material and interstellar dust grains, as well as highly processed asteroids and fragments of other planets.

In addition to the presentation, Dolores will display examples of typical meteorites and "meteorwrongs" (objects misidentified as meteorites). The display will include one of the oldest rocks in the Solar System (4.567 billion years old), part of the iron-nickel core of a large asteroid, and a meteorite that is thought to be a piece of the asteroid Vesta!

If there is time, Dolores will also give us a preview on the "OSIRIS-REx LIST" (a mission to visit a carbonaceous asteroid and bring back a sample) and the November observing opportunity of near-Earth asteroid 2005 YU55, which will pass within 0.85 lunar distances from the Earth on November 8. The asteroid measures 400 meters - about 1/4 of mile across! This will be the closest approach to date by an object this large; but fortunately the orbit of 2005 YU55 has been thoroughly calculated, and there is no chance of a collision with Earth during the next 100 years at least. Therefore, we can take out our binoculars and telescopes in November to watch 2005 YU55 sail harmlessly by as an 11th-magnitude object.

Dolores Hill is senior research special-

ist at the University of Arizona Lunar and Planetary Laboratory (LPL), where she analyzes and classifies meteorites, supports LPL meteorite research activities, and provides hands-on meteorite opportunities for school groups and special public events. Since 1981, she has used LPL's electron microprobe and gamma ray spectrometer laboratory to analyze meteorites from all over the world, including Lunar and Martian meteorites. Dolores is currently part of the Education and Public Outreach Team for the proposed NASA OSIRIS-REx sample return mission to Potentially Hazardous Asteroid (PHA) RQ36. §



Astronomical Calendar 2012 Orders

By Terri, Event Coordinator

Starting at the October PAS meeting, Jerry Belcher will begin taking orders for this awesome Astronomical Calendar. An example will be at the meetings for you to see. This calendar is 15" by 11" and is 81

pages full of all sorts of details about the night sky. I purchased one last year and have used it to plan the PAS events.

Please note that this is not the "Year in Space" desk calendar - the one with the

space pictures. This is a complete year of astronomic events, including star charts and astronomical data. You will probably want to order both calendars for 2012. Please come see the Astronomical Calendar at the PAS meetings and order yours today.

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PAS Upcoming October Events

By Terri, Event Coordinator,
<http://www.pasaz.org/forums/calendar.php>

We have a lot of events lined up for October 2011. We'd love to have your assistance and attendance at many of them. Please RSVP when it is requested. See you there!

As we finish out September with two events, we then move into October with a bunch of fun events to attend. RSVP is mostly through Terri (events@pasaz.org), unless otherwise noted.

Sept 29: PAS Meeting of the Minds, 7pm to 10pm in Rm G-147 at PVCC. Everyone is welcome. It is a PAS business meeting (club business). No children please. Public event.

Sept 30: School Star Party in Fountain Hills area, 6pm to 10pm, food involved. See Calendar and Forums for details. RSVP required with Terri by day before event.

Oct 4: CTCA Private Star Party, from 6:30pm to 8:30pm. PAStimes Star Tours members only. This is a paid event. RSVP is with Joe Collins (jcollins79@cox.net).

Oct 6: PAS Meeting in the Library of PVCC, 7pm to 9:30pm. Everyone is welcome! Guest speaker's topic is "Touchy, Feely Meteorites". Public event.

Oct 8: International Observe the Moon Night. PAS is holding the Moon Marathon and making it a public star party at Mike's home in Carefree. RSVP is required with

Terri for Moon Marathon. Potluck at 4pm. Moon Marathon starts at 6pm. General public viewing begins as early as 7pm. Public RSVP's with Mike at 480-488-3031. Everyone is welcome! Public event.

Oct 9: Bookmans Telescope Workshop in Bookmans back room from 1:30pm to 3:30pm. Come help us help new astronomers with their telescopes. RSVP with Terri. Public must RSVP to attend this event. In your RSVP, mention the type of scope you have. Thanks. Public event.

Oct 13: PVCC Telescope Workshop and Star Party, 7:30pm to 10pm. Everyone is welcome. RSVP with Terri to attend. In your RSVP, mention the type of scope you need help with. Public event.

Oct 14: Paid Private Event in Scottsdale - PAStimes Star Tour members RSVP with Terri.

Oct 15: Private Star Party in Laveen AZ

Oct 18: Back up date for CTCA of Oct 4.

Oct 20: Indoor / Outdoor Astronomy Event with Star Party at PVCC by Rm G-147 from 7:30pm to 9:30pm. Outdoors there will be telescopes set up to show the night sky. Indoors we will have Meteorite Man and other demos available. Bring the whole family! RSVP with Terri to attend. Public event.

Oct 21: Private event at a school in Surprise, 7pm to 9pm. Refreshments and gas reimbursement provided. RSVP with Terri to attend.

Oct 22: Orionids Meteor Shower and Star Party at Mike's in Carefree. RSVP with Mike to attend 480-488-3031. Public event. Potluck starts at 6pm.

Oct 27: Public Star Party at ASU West Campus from 7pm to 9pm. RSVP is with Dr Paul Schmitdke paul.schmidtke@asu.edu. ASU is at 47th Ave & Thunderbird Rd in Phoenix.

(Please note that the October Meeting of the Minds is cancelled due to the star party at ASU. Please attend the ASU West Star Party on this evening, and of course don't miss the Meeting of the Minds on September 29!)

Oct 28: Private event at Desert Botanical Garden 7pm to 9pm. PAStimes Star Tour members RSVP with Terri to attend.

Oct 29: Private Halloween and Star Party at Mike's home in Carefree. 4pm potluck. Jupiter will be at opposition. RSVP with Mike to attend.

Nov 3: PAS Meeting in the Library of PVCC, 7pm to 9:30pm. Everyone is welcome! Guest speaker's topic is "Holding a Piece of the Stars and Planets in Your Hands". Public event. §

PVCC Black Mountain Campus Star Party Reveiw 9/22

By Terri, Event Coordinator

Many PAS people came together to make this event a success. I wish to thank them all: Albert Tucker, Don Boyd, Kraig Nelson, Dewell Howell, Tim Jones, Bob Christ, Mike Marron, William and Terri Finch, Chris Johnson, Kevin Harcey, Steve Palmer, and Pete Morrissey. Many thanks also to Jenny Neureuther of Paradise Valley Community College, for helping to set up this event. And I'd like to thank Loretta

Mondragon and the security guy, Kevin, for assisting in the location setup.

We had 26 public RSVP's prior to the start of the event. There were many participants from Cactus Shadow HS, which is next door to PVCC's Black Mountain campus, as well as the students at PVCC who attended, due to all the wonderful fliers all over the campus. Many of the PVCC students showed up around 7pm and stayed

until 9pm. You can tell which ones are the students, they carry with them the worksheet they need to fill in to get credit for being at that event. Dewell and I signed / initialed a bunch of lab worksheets for the students.

We started out setting up prior to sun-down. My goal in starting the event at 6pm was to catch the setting sun, but none of our Solar Scopes were there, and we were hav-

PVCC Black Mountain Campus Star Party Reveiw 9/22

ing setup issues to begin. The area where we were to set up was supposed to have a slab of cement poured for PAS to do the star party on. But the concrete hasn't been poured yet, and that area is currently full of jumping cactus. So, we picked the closest NW corner to where we would have set up, and blocked off that part of the parking lot, which worked great.

Soon we discovered the lighting at that location was rather bright over the parking lot. So, Jenny, Kevin, and Loretta (all three from PVCC) found a box to put over one of the lights. That really helped. We will be looking for 17.5" by 13" boxes (probably 9" deep) to cover the lights in the future. If you have any boxes about that size, I wouldn't go much smaller, please store them or bring them to PVCC for Jenny to take up to the Black Mountain Campus for

use on the parking lot lights.

Here's what we showed that night, not necessarily in this order: Chris was focused on Arcturus for a while, Dewell had M13 (the Hercules Cluster), Tim found the Ring Nebula per my request. Bob showed M31 (the Andromeda Galaxy) for a while, Chris moved to Alberio, Bob found Uranus, Tim had Andromeda and then Bob moved his scope back to Andromeda too. We saw Jupiter and M13 through Chris's scope.

In attendance from the public, I counted 7 kids (under 12), and about 60 adults and PVCC students. Once we figured out how to get rid of the lighting, the night went great! I only got to play Q & A with two of the kids, as the rest left before I could catch them to ask them questions. Mike, of course, kept the attention of everyone there with his meteorite display, while we were

looking for objects to show. Cactus Shadow HS was having homecoming and we were treated to fireworks at the end of their event. I caught some photos that I will put in the Photo Gallery on the PAS website for all to enjoy.

It was a very successful event, and really good for our first time there. We hope to do a lot more star parties up at this location. It may be a bit of a ways to drive, but as long as we can keep the lighting off, we can have some great, darker skies to view. We would love to see everyone at the next Black Mountain event. Thanks to all who attended, and all who helped. A discussion about this event, with results and ideas we are sharing in the discussion, can be found in this forum thread: <http://www.pasaz.org/forums/showthread.php?t=563>

Proposals Made at Aug 25 MOM's

By Joe Collins

At the "Meeting of the Minds" PAS business meeting on August 25, I made the following suggestions:

1) I proposed that PAS gift to Paradise Valley Community College the LX200 Meade SCT that I had previously donated to PAS, so they can provide a dome or protective housing for it and a stationary pier for permanent mounting. The reasons for this:

A) PAS has had it in storage for over 3/4 of a year (i.e. it is idle), and even though we have discussed it in two MoMs, there has not been a vote on what to do with it. I think we should do something with it as it is a resource not being used.

B) Originally, when I donated it to PAS, I thought that it could be tuned up and put on a scope dolly for use at PAS sky tour

parties, but there has been no interest in doing this, as expressed by PAS members since last year. It is too large and heavy for transport to the PAS Sky Tour team events, and takes too long to set up as a mobile scope.

C) PVCC has the resources to further investigate and fix the image shift issue idiosyncrasy of this telescope (it may only need a Peterson Engineering focus upgrade) and PVCC has an available pad at the new college "dark site", so therefore I made my proposal.

If any PAS members have some other counter-proposals, please sound out! Here are two counter-proposals that members can consider as alternatives:

a) fix the scope and set it up on a permanent pier at a PAS member's house or

dark site (such as Dave Helman's for example).

b) fix the scope and sell it on CraigsList or AstroMart, or have a raffle for income to the PAS club.

2) I also proposed that for each Sky Tour / paid event we take Dark Sky Meter (DSM) readings and include the DSM data in our Event newsletters or official reports. For examples, we can report on the average and best DSM numbers for the night, and reduced DSM numbers for identified light pollution sources that night.

3) I also proposed that every once in a while we should have a "Telescope Tune-up Lab" with laser collimators available for Newtonian and SCT telescopes, or a workshop on "how to collimate your telescope/finder/optics".§

Upcoming Public & Private Events at Mike's Home in Carefree

By Terri, Event Coordinator

We have scheduled more events at Mike's home in Carefree, both public and private events, due to the interest from PAS members. They are all weather permitting. Everyone is welcome at the public events. At the private events, PAS members only, please.

All RSVP's to these events go to Mike 480-488-3031.

Oct 8, 2011: International Observe the Moon night with the PAS Moon Marathon, Potluck, and Public Star Party. 4pm to

whenever.

Oct 22, 2011: Orionids Meteor Shower and Public Star Party with Potluck. 6pm to whenever.

Oct 29, 2011: Mike's Halloween and Star Party. Private event from 4pm to whenever.

Dec 10, 2011: PAS Moon Marathon back up date. Public event starts at 3pm with a potluck.

Dec 31, 2011: New Years' Eve Star Party Private with Potluck (Event is in the

planning stages) 6pm to whenever.

Apr 28, 2012: Public Astronomy Day and Planetary Line up Star Party. 4 Planets, Moon, and Orion Nebula are the highlights for this event from 5pm to whenever.

May 20, 2012: Public Solar Eclipse, Star Party and Potluck from 3pm to 10pm.

Oct 27, 2012: Mike's Halloween and Star Party. Private event from 4pm to whenever.

We hope to see you at these awesome events! §

PVCC Telescope Workshop Review of Sept 15

By Terri, Event Coordinator

There were three public RSVP's for this event: David C, Simon, and Moishe. All three showed up, along with PAS members Chet Schuler, Don Boyd, Mike Maron, Kevin Harcey, John Pulis, and William and Terri Finch. Dave Hellman and Jenny Neureuther, both of Paradise Valley Community College, were there to assist. Jenny set up two of the PVCC 6" scopes (Newtonian Dobs) outside with eyepieces. Chet took out the 16" Dob and set it up, then found out it had trouble, so Chet, Don and Simon worked on trying to get it to colli-mate.

Chet started out with the 16" scope, working to adjust it, and then moved to one of the 6" scopes to show a few objects. The Moon didn't come up until about 8:30; Jupiter was following the Moon through the sky. Jenny was first to find Jupiter.

Jupiter was awesome with four moons to start; then later, only three were seen. My smartphone App for finding solar system

objects ("Where is Io?") showed that one of the moons was behind or in front of Jupiter, so we figured that Europa was hiding from us. (A follow-up check with astronomy software showed that Europa in fact transited Jupiter during the event.)

I took a stab at finding the Andromeda Galaxy, and a PVCC student named Patrick helped me in the search. Thank you Patrick. We didn't find it at first, but it was fun trying, and nice to meet you. Later I borrowed a star chart from Mike, and together, Jenny and I finally found Andromeda. It wasn't super impressive but we were glad we finally got it. In the meantime, Chet got the Ring Nebula.

Jenny had a crowd of four PVCC students looking at the objects she found, all night long.

And the highlight of the night was that Channel 5, Channel 10 and Channel 12 News were there, taking pictures of what we were doing. They interviewed Jenny at

least twice, and got Mike talking about meteorites for about half an hour. Astronomy was in the news because a fireball meteor had been seen over Phoenix the previous night. I didn't see any of this footage, as by the time we got home, it was midnight. I looked for news at that hour, but only found talk shows.

As usual, Mike stole the show. Many of the PVCC students enjoyed listening to Mike talk about the meteorites.

It was a very successful event and we had a good turnout. Not many of the public showed up, but with the PVCC students there, we had a good audience. They were all so interested in the astronomy and in looking through the telescopes. We were glad they were there to make the night a success. Thanks to all the PAS Members who attended and helped out both with the star party and in helping Jenny clean up when we were all done for the night. It was a long night! §

PAS Meeting Review of Sept 1

By Terri, Event Coordinator

I wish to start with many thanks to those who brought snacks. The water this month was provided by the PAS Snack Fund. Bruce and Sherry Myers brought the cinnamon cookies. Sam brought the popcorn. The Oreos were provided by Bob Senzer, who wasn't able to be at the meeting, but has left a large supply of Oreo cookies for our enjoyment at future meet-

ings. The diet Coke and cans of Crush were provided by Mike.

Bruce Wurst, our new PAS President, opened the meeting with a few brief announcements. Since this is the first meeting of the PAS season, we had decided to make it a "Members' Night". But no volunteers had signed up to speak at Members' Night this year, so Mike was nice enough to be our guest speaker.

Announcements included the Portal Star Party - which was to happen that weekend, but was weathered out. We talked about upcoming events and handouts, and about the snack fund. Many PAS members paid their dues to start the new year.

Then, Mike took the floor, and did a very good presentation on Asteroid Mining. Everyone enjoyed it and lots of questions were asked.

See **Meeting** page 6

The Planets This Month

by Leah Sapir

This month's feature planet is Jupiter, which reaches opposition in October. That means that we'll be able to see Jupiter all night, and be able to follow the dance of its moons through any telescope or even a good set of binoculars. (Galileo's telescope, with which he discovered Jupiter's four largest moons, was no stronger than most of today's binoculars.)

Uranus and Neptune will also be visible for most of the night, but require a telescope. Both planets will be high in the east after sunset. Uranus sets at 6 am at the beginning of October, and 4 am at the end of the month. Neptune sets about 3 hours earlier.

Mars is starting to rise earlier – still not

in the early evening sky, but definitely visible. It rises around 1:30 at the beginning of October, and 1:00 at the end of the month.

Saturn is too close to the Sun to be easily visible; it sets during evening twilight at the beginning of the month, and rises in morning twilight at the end of the month. Next month we'll be able to consider it a morning star.

Venus and Mercury are evening stars this month, but are visible only in the twilight. Both set around 6:30 pm, and are more visible towards the end of the month only because the Sun sets earlier each day.

On October 13-14, the full Moon will follow Jupiter across the sky all night. On October 14-15, the Moon will be near the

Pleiades, and on October 15-16 it will accompany the Hyades. On October 20, the Moon will be near the Beehive Cluster from around 1 am to dawn, and on October 21 it will be near Mars.

October 21 is also the peak for the Orionid meteor shower, although the third-quarter moon will interfere a little. Still, some meteors might be visible, especially after midnight. The meteors can be seen from October 20-22, and are expected to be best before dawn on October 21 and 22. The Orionid meteor shower is composed of bits of dust left by Halley's comet.

On October 27 and 28, the crescent Moon will be near Venus and Mercury in the west after sunset, but they will all be visible only in the twilight. §

Small Wonders

By Darrell Spencer

If there's one thing to be learned by falling victim to "reverse aperture fever", it's that you can't judge a book by its cover. Put more directly, you can't judge the capability of a telescope by its size. I'm not sure how it happened and it really doesn't matter, but I have become quite fond of exercising what many would call reverse aperture fever at home. I'm referring to small refractors – in my case, 90mm and smaller.

In fact, they've become my primary weapon of choice in the backyard. While my personal bias leans toward older, reasonably common long-focus Japanese achromats, today's market is blessed with a number of high-end smaller telescopes as well, from companies like Astro-Tech, Stellarview, Televue, and Takahashi. These are mostly apochromatic and are also often used for astrophotography, but they serve admirably in the same role I discuss here.

I suppose there are a number of reasons that can compel the use of small refractors: nostalgia, charm, attractive cost, extreme portability, performance. Although I'm not sure charm, nostalgia or attractive cost drive the use of the current crop of premium scopes, the allure is there and the manufacturers know it.

Did I mention performance in association with small telescopes? Well, certainly these little tubes would not be ideal for scrutinizing 13th magnitude galaxies in Eridanus. But, for the backyard observer in suburbia for whom time is precious and

light pollution ever-present, they make an ideal choice.

If your position is anywhere inside the perimeter of suburban Phoenix, i.e. roughly the area surrounded by a green ring on the light dome map and your time is limited, or your available scope is either large and cumbersome or requires lengthy setup time, or if you don't have the luxury of a permanent observatory, then don't underestimate the quality observing made possible with a small telescope. And if the last time you used one was when you were ten years old, I'd recommend a review with a more experienced eye. They're not just for kids!

From my own light-spattered backyard, the Moon provides hours of enjoyment from a variety of small soldiers. While I've spent a lot of time cruising the terminator using tubes with a focal length as short as 600mm, most of my serious lunar observations are with a 3" Royal f15 with a generous focal length of 1200mm! This little monster is a serious tool that has revealed surprising detail. For example, I happened to enjoy a night of very good seeing during the summer of 2008 and, near full Moon, am quite certain I perceived three white "spots" on the floor of Plato. Craterlets! With a 76mm telescope! But, before you scalp me, I actually did some checking and found that I wasn't imagining things. There is a precedent for this.

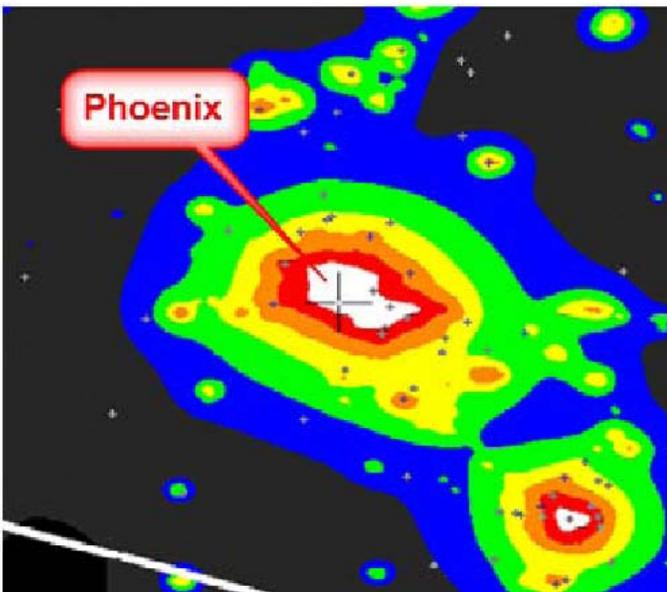
Patrick Moore has suggested that, rather than Dawes or Rayleigh criteria, a better lunar formula is the simple, but fairly accurate $d = 9/D$, where d is the diameter of the crater in miles and D is the aperture of the telescope in inches. While this would suggest I was mistaken, no single formula can cover all surface features and light angles when observing the Moon and her features with widely varying contrast. So, did I see craterlets? Well, I logged the observation.

Observing planets with small-aperture refractors is to experience them in their element. At f15, even Jupiter shows no chromatic aberration (false color). My f17 60mm Royal can even render retina-scorching Venus with only the slightest hint of color. I

have spent countless hours observing the bright planets with these babies, but by far, the most time has been on Jupiter. With such a dynamic system, there's never a dull moment. I've watched dozens of moon and shadow transits, experienced occultations (one was a complete surprise and delight) and suspected the presence of the Great Red Spot in a 50mm f12. (It was confirmed that night in a 60mm f13). Of course, Saturn's rings and the Cassini division are easy prey – if the angle is favorable. Occasionally, subtle shading is on the verge of detection in 60mm at f15 and 150x or so. Blue color is discernible in both Uranus and Neptune, with Uranus seen as a tiny disc in the 3-inch scope.

The sky is full of showcase double stars that are rendered exquisitely in a small refractor. Some of these gems can be quite a challenge, but that's part of the fun! The Double Double is a piece of cake for a decent 60mm telescope. Of similar separation as the Double Double is the companion of Mu Bootis, but lesser magnitude makes this pair a challenge – although I've caught the pair in 76mm. Cassiopeia holds some nice targets – including Eta and Iota that yield to the mighty 60. Iota is a fine triple. Although I'm pushing the envelope, I look forward to the next few months as I again have the opportunity to try and get more than a peanut from Porrima (Gamma Virginis) in my 76/1200.

Lots of the Messier fuzzies can be observed with these instruments, as well as a number of planetary nebulae from within suburban environs. But, the notion that they're somehow inferior to larger, more robust instruments is simply not true. I probably have more observing time at the eyepiece of small scopes than I do the larger ones. Besides, we all know that size doesn't matter.



Southern Arizona Light dome.

NASA Space Place Dark Clues to the Universe

By Dr. Marc Rayman

Urban astronomers are always wishing for darker skies. But that complaint is due to light from Earth. What about the light coming from the night sky itself? When you think about it, why is the sky dark at all?

Of course, space appears dark at night because that is when our side of Earth faces away from the Sun. But what about all those other suns? Our own Milky Way galaxy contains over 200 billion stars, and the entire universe probably contains over 100 billion galaxies. You might suppose that that many stars would light up the night like daytime!

Until the 20th century, astronomers didn't think it was even possible to count all the stars in the universe. They thought the universe was infinite and unchanging.

Besides being very hard to imagine, the trouble with an infinite universe is that no matter where you look in the night sky, you should see a star. Stars should overlap each other in the sky like tree trunks in the middle of a very thick forest. But, if this were the case, the sky would be blazing

with light. This problem greatly troubled astronomers and became known as “Olbers’ Paradox” after the 19th century astronomer Heinrich Olbers who wrote about it, although he was not the first to raise this astronomical mystery.

To try to explain the paradox, some 19th century scientists thought that dust clouds between the stars must be absorbing a lot of the starlight so it wouldn't shine through to us. But later scientists realized that the dust itself would absorb so much energy from the starlight that eventually it would glow as hot and bright as the stars themselves.

Astronomers now realize that the universe is not infinite. A finite universe—that is, a universe of limited size—even one with trillions of stars, just wouldn't have enough stars to light up all of space.

Although the idea of a finite universe explains why Earth's sky is dark at night, other factors work to make it even darker.

The universe is expanding. As a result, the light that leaves a distant galaxy

today will have much farther to travel to our eyes than the light that left it a million years ago or even one year ago. That means the amount of light energy reaching us from distant stars dwindles all the time. And the farther away the star, the less bright it will look to us.

Also, because space is expanding, the wavelengths of the light passing through it are expanding. Thus, the farther the light has traveled, the more red-shifted (and lower in energy) it becomes, perhaps red-shifting right out of the visible range. So, even darker skies prevail.

The universe, both finite in size and finite in age, is full of wonderful sights. See some bright, beautiful images of faraway galaxies against the blackness of space at the Space Place image galleries. Visit <http://spaceplace.nasa.gov/search/?q=gallery>.

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

Meeting

From page 4

There were a few more announcements, and then we all congratulated Bruce. His first meeting as PAS president was also his lucky night: he won the 50/50 raffle in which the grand sum of \$14 was split between Bruce and PAS.

Thank you all for attending. It was a good meeting. Afterwards several members decided to continue the good feeling by going to Village Inn for a snack and some socializing. This group included Sam Inzana, Mike Marron, Judy Wolf, Kevin Harcey, John Pulis, Chris Johnson, Bruce Wurst, and William and Terri Finch.

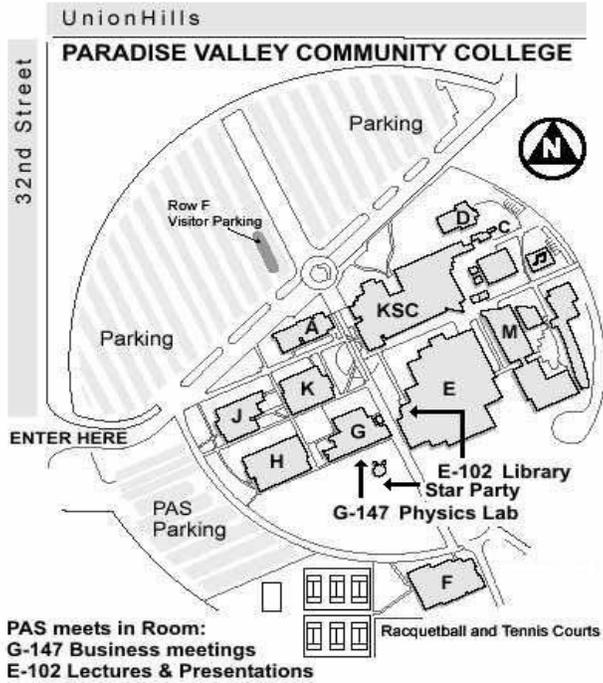
Thanks to Kevin for donating to the PAS Snack Fund. His donation will help us get a case of bottled water for the next meeting. We hope to see you at the October meeting in which we will hear a talk about “Touchy, Feely Meteorites”. See you there!
§



This Hubble Space Telescope image of Galaxy NGC 4414 was used to help calculate the expansion rate of the universe. The galaxy is about 60 million light-years away. Credit: NASA and The Hubble Heritage Team (STScI/AURA)

Map of PVCC Main Location

18401 N. 32nd Street | Phoenix, AZ 85032



Map of PVCC Black Mountain

34250 N. 60th Street | Scottsdale, AZ 85266



See page 2 for more information

October

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
						1
2	3	4 CTCA	5	6 PAS Meeting	7	8 Private star Party, Moon Marathon
9 Bookmans Telescope Workshop	10 Columbus Day	11	12	13 PVCC Telescope Workshop	14 Private Star Party	15
16	17	18 Backup CTCA	19	20 PVCC Indoor/Outdoor	21 Private Star Party	22 Star Party@Mike's
23	24	25	26	27 ASU West Star Party	28 Private Star Party	29 Private Star Party
30	31 Halloween					

Telescope For Sale

The scope is a Meade ETX 90mm with computer hand pad and tripod. The owner (a lady) is asking \$350, retails for \$600. Contact Dave Hellman to view scope and purchase it.
david.hellmann@pvmail.maricopa.edu. ***

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

To:

PAS Guest Speaker Line-up for Fall 2011

By Terri, Event Coordinator, Events@pasaz.org

Nov 3: Bob Holmes: "Holding a Piece of the Stars and Planets in Your Hand"

Dec 1: David Williams: "Planet Rovers: From Lunokhod to Spirit and Beyond"

Jan 5 in G-147: Bryan Penprase: "The Power of Stars" lecture and book signing

If you have an idea for a guest speaker, please contact Terri at events@pasaz.org.

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What's Up For October

By Rod Sutter, PAS Past President

Name	Date	Rise	Set
Mercury	10-15-11	07:25	18:22
Venus	10-15-11	07:45	18:39
Mars	10-15-11	01:14	14:49
Jupiter	10-15-11	18:34	07:39
Saturn	10-15-11	06:21	17:55
Uranus	10-15-11	16:56	05:00
Neptune	10-15-11	15:19	02:16
Pluto	10-15-11	11:58	22:20

All Times Arizona Time

October 15 2011

Sunrise: 06:28

Sunset: 17:51

New: September 27



Q1: October 4



Full: October 12



Q3: October 20

