

PAStimes

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Dean Salman, November 5 Guest Speaker at PAS

By Dean Salman

I have been doing astrophotography since the early 1970's and switch the CCD imaging in 2001. I have been published in Astronomy and Sky & Telescope along with a number of other publications

around the world. I am currently working on a project capturing detailed images of the Sharpless catalog using an automated setup in my backyard and two observatories in New Mexico. My presentation will be what is needed to setup an automated

observatory. My most active web sites are www.ccdimages.com and www.sharplesscatalog.com I have also given presentations at the Okie-Tex Star Party and Texas Star Party as well at Grand Canyon Star Party. ***

PAS Meeting Oct 1 Review

By Terri, Event Coordinator

Link to Downloads section of PAS Website:

<http://www.pasaz.org/forums/downloads.php?do=cat&id=1>

The photos for this event are in the Photo Gallery on the PAS Website. Check them out!

It was a very good but busy meeting. We had 3 guest speakers, the first 2 of whom were schedule for 10 minutes each. Tom Sharp came to us from ASU to tell us about some awesome upcoming ASU Events. The 2 fliers for these events can be found in the Downloads section of the website labeled "ASU Earth & Science....." The next speaker we had was Robert Martino who came to us from Kitt Peak to tell us about their upcoming Kitt Peak Programs. The fliers for these events can also be found in the downloads section of the PAS website, at the link above, labeled "Kitt Peak Classes....."

Then we turned the floor over to Dan Heim who did a spectacular presentation on Light Pollution. Everyone was involved in this topic and enjoyed it. Many questions came about and unfortunately we had to cut his presentation a tad bit shorter than he wanted us to due to the speakers prior to his presentation. I'm sorry Dan. However, Dan

will be back to do a presentation to PAS on Weightlessness, soon. Watch for the announcement in the PAS Speaker Line Up document at this link <http://www.pasaz.org/forums/downloads.php?do=file&id=8>.

At the conclusion of the meeting, the 50/50 raffle was won by Dan Heim!!! Congratulations Dan! You said you never win, and guess what... you did! We also passed out the post cards to those who wanted to do follow up phone calls for the Post Card Project.

Many thanks goes to our three guest speakers who made this evening WONDERFUL!!! ***



Tom Sharp



Robert Martino



Dan Heim

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Upcoming November Events

By Terri, Event Coordinator

For November we only have a few events due to the holidays sneaking in. But should some more come into existence, always be sure to check the online calendar for changes and updates to the events.

Nov 5: PAS Meeting, Library at PVCC 7pm to 9:30pm. Awesome speaker coming to tell us about CCD imaging remotely... which is very similar to what we are doing with our VSP's (Virtual Star Parties). Will be an awesome meeting. Also read up on what will be at the meeting in the article titled: NOV 5 PAS Meeting, written by

Terri, in this issue.

Nov 19: We have the Meeting of the Minds. Most of the time this meeting gets canceled due to the holidays. It is also a week ahead of schedule because of Turkey Day. Watch for that change in the December MOM's as well. Verify with Terri, by phone or email, that we are having this meeting before going to it.

Nov 21: The Next VIRTUAL STAR PARTY. Location has not been chosen yet. If you would like to host this party, all it takes is HIGH SPEED INTERNET. You

do not have to supply the computer, as those attending should be bringing their own laptops to use. RSVP is required. Bring a snack and drink to share.

Nov 23: Imagine Elementary school has a star party scheduled from 7pm - 10pm on this Monday. If you can assist, please RSVP with Terri. More details can be found in the Forums at: <http://www.pasaz.org/forums/showthread.php?t=343>

Nov 26: HAPPY THANKSGIVING TO ALL!!! ***

Oct 29 Meeting Of The Mind Agenda

Download the Agenda at

<http://www.pasaz.org/forums/downloads.php?do=file&id=60>

Originally, we were going to have those who witnessed or had something to report or share on the LCROSS mission, talk about it. But, no one has come forward in email to say they have anything to share about it. I will leave it open so that if anyone, at the MOM's wants to talk about it, we will begin the meeting with LCROSS as the first topic. Maybe you want to talk about your disappointment of not seeing anything.

The second topic will be about the POST CARD PROJECT. The deadline for

finishing up the Resort phone calls is to have them all accomplished by this evening's meeting. So, if you haven't already, please get those done. Then, bring your results to the meeting. I'd like to take with me your notes on what you found out, what you discussed, questions the resort asked, answers that were given, etc. I want to compile the info and make a page that all of the Star Tours group members can review. Then, we want to discuss the next step. What do we do from here? Do we have me call the INTERESTED resorts, sent them a packet of info with pricing and Booking Doc, or what? So, that's the first MAIN

topic of the night.

Then the rest of the topics will be what ever is on the PAS Agenda at the link above. There aren't many topics and it if wasn't for the hefty topic of the Post Card project, we might not be having the meeting. I predict the meeting will close early but there can be socializing afterwards to 10pm. Also, if Chris wants to, he can talk about VSP's or his CEO star parties after all topics have been discussed. If you have a topic to add to the Agenda, please send it to Terri so that your topic is included in this night's meeting. ***

Year In Space 2010 Calendar Orders

Deadline to order Nov 19, 2009

We currently only have 3 calendars on order. In order to get them for \$10 a piece, we need to have 10 calendars on order. If you want a calendar, let me know right away by reserving one, two, three by calling me 602-561-5398 or emailing me Events@pasaz.org and then getting the cash to me by Nov 19th, the Meeting of the Minds. Cash must be in hand before I will

place the order. If you want to get on the list for the calendars at \$10 per calendar, let me know that, or if you don't mind it to be \$11 each calendar, let me know, as it makes a difference whether we put the order in or not. Those who are ok with \$11 per calendar, I can put that order in without having to reach the \$10/calendar pricing.

For more info on this calendar and to see examples of it on line go to

www.yearinspace.com. The deadline above is chosen because it takes Year In Space about 2 weeks to get the box of calendars to me. Thus, I would want to be sure to have them in hand prior to the December PAS meeting so I may get them out to everyone before Christmas, if they are planning to give it as a gift. These calendars make awesome gifts. Not too expensive and they are a reminder of you all year long. Get your order to me today! ***

Nov 5 PAS Meeting

At this PAS Meeting will be a ton of hand-outs for your enjoyment and taking, that were gathered from the Flagstaff Festival of Science. Feel free to help yourself.

Also, I will be bringing the PAS T-shirts for sale. We don't have many left so your help in making the supply of T-shirts dwindle to "none left" would be awesome. They make great gifts.... We currently

have the Earth and Symbol shirts left. We are selling them at \$10 a piece or 3 shirts for \$20. Come grab them while they are hot!!! ***

Scout Star Event at Saguaro Lake Review

By Bob Christ

Tim Jones and I shared the sky with Cub and Boy Scouts working on their astronomy belt loops (Cubs) and merit badges (Boy Scouts) on Saturday, October 24. We both had been Scouts, so this was a kind of "homecoming" for us. The event was held at SRP's campsite located just downstream from the dam at Saguaro Lake. Upon passing through the code-required gate we entered into a very nice recreation area for such an event to be held. It was free-time when we arrived, and numerous children and adults were taking advantage of a large grass field to play. It was on this field that we set up the scopes. Sheer, high cliffs to the south not only provided a magnificent sight but also a protected area that bald eagles call home. Numerous tents were set up and all were having a grand time.

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

Tim held "Cub Scout Court" to provide information pertinent to their quest for astronomy belt loops and answered their questions while I worked with Boy Scouts and adults prior to the onrush of eager eyes when Tim's session ended. A significant number of parents attended the event and they too exhibited high interest. My telescope was initially trained on the Andromeda Galaxy and it generated a lot of interest. One of the scouts said he couldn't see anything, and, thinking per-

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

At one point I felt a tug on my trousers and saw a small boy trying to get my attention. I leaned over (very far) and he said to me in a simple declarative sentence: "I'm not a Cub yet, I'm in Kindergarten." It was a precious moment. Our support was very much appreciated, and we appreciated the opportunity to share our scopes and knowledge that evening with the wonderful Scouting organization.

New Universe Theory

By Bobby McGehee .

I am all tied up with the manuscript for my new book "Model of the Universe". I will send you a copy when it is published. The publisher received the manuscript on

Monday 9/28. (will be in print in about 45 days) I don't consider the concept a theory anymore. Therefore it is a Model.... it is provable, and most of the proof is in the new text. I think even Chet S and Mike M

will agree. Have you reviewed the "New Universe Theory with Laws of Physics"? Regards to you and all of PAS. You have a great organization there. ***

Temple Beth Star Party 10/2 Review

By Terri, Event Coordinator

Link to photos for this event:

http://www.pasaz.org/forums/gallery.php?g2_itemId=4166

It was a huge turnout for their event. It started with Sam, Frank & Mike arriving at the location about 1/2 hour early. They said at that time they could see the Sun and were viewing it safely through their solar scope. By the time Don and I arrived, we were clouded over. The show turned to Mike, who was so awesome to keep everyone entertained with his meteorites while the rest of the Telescope Team hoped for but didn't see the night sky. William arrived

later, just before the event began. In attendance was probably about 100+

people from the Congregation. Their party was awesome, as usual. We set up in a different location, on which Sam chose last year. It was definitely a better place to be away from the big lights. We must set up there again next year. This is a yearly event.

As the evening progressed, it started to drizzle on us, so we covered our scopes and waited a bit more, hoping for clear skies. Never got the clear sky part, and it didn't drizzle that long, so around 9:30, which is our pack up time, we packed up our scopes. Terry, my contact at the event, was happy

to see us, but understood we couldn't control the weather, and if we had know earlier in the afternoon that the clouds would take over, we would have canceled our portion of the event.

After our evening under cloudy skies, everyone was hungry (PAS TEAM), so we went to 5 & Diner up the street and enjoyed some snacks. It was good to socialize. Thanks to all the volunteers. Maybe next year we can count on seeing something in the night sky. 77 photos for this event are at the link listed above. Enjoy! ***

Halloween Star Party For PAS Members At Mike's!!!

By Terri, Event Coordinator

Date: Oct 31, 2009

Start time: 6pm

Location: Mike's home in Carefree

RSVP required for NON PAS members invited by PAS members

10/31 Halloween Star Party at Mike's. If you plan to attend, please bring the following items:

1) It's a pot luck, bring a main dish and a drink to share suggestions: fried chicken, casserole, lasagna, a meat dish, veggie dish or tray. Drinks could be a 6 pack of soda, or 6-10 bottles of water, or a 2 liter bottle soda. Mike is allowing alcohol as long as those drinking DO NOT DRIVE HOME

after the party. Plan to stay the night if you drink any alcohol, please. If you bring snack items instead of a main dish, please bring one extra snack, so plan to bring 2 items instead of one. The reason for this is, we want to have enough to eat and most of us can't have the snack items in their diet. You know, us diabetics have trouble with that. So, for those of us who prefer, we would like to insist on main dish type items.

2) wear a costume, this is a Halloween party

3) bring one Halloween decoration per person, take it home when you leave.

4) Bring a game, or movie, to share. If everyone brings one fun thing to do, we

will have plenty to keep the night going. We can have groups of people playing games, working on puzzles, what ever they want to do through the night.

No RSVP is needed for PAS members. However, if you invite anyone who isn't a PAS member and they plan to attend, please RSVP their attendance by dropping Mike an email or calling him to confirm it is alright. RSVP deadline will be 3pm

day of event.

Start time of event is 6pm. Arrive any-time from 6pm and on.

Sleep over is available. Bring what you need to sleep over, if you plan to do so. ***

Seven Springs Scout Star Party Review

By Sam Insana

On October 3, 2009, Frank, Sam and Mike went to Seven Springs for a boy scout star party. Sam and Frank arrived early and went birding, finding 10 species including a red tailed hawk, ruby crowned kinglet, black phoebe, canyon wren, Gila woodpecker, raven, turkey vulture, flicker, Lincoln sparrow, and a phanopepela. At 4:30 pm Sam and Frank showed the sun with a PST at 40 power. We demonstrated a solar prominence that was about 20,000 miles long and about 10,000 miles high. About half the adults and scouts were able to see it, since the clouds covered it from time to time. Then Mike arrived in time for a fantastic dinner. They served us hamburgers, hot dogs, Caesar salad, beans, chips, and various deserts and drinks. Then they

had a campfire presentation where the kids put on astronomy related skits. One presentation was really good and funny. Then they introduced Mike, Frank and I as being from PAS and said for everyone to go to the scopes. Frank showed the moon, I showed Jupiter, and Mike showed the meteorites. The clouds again covered the objects periodically but everyone finally got to see the 2 objects from 7 pm until 9 pm. Frank asked questions of the kids making them use their imaginations on trying to figure out what caused the various things they were seeing on the moon. Of course Mike was his usual entertaining self and educated the kids in a fun way. Jupiter sold itself without much help from me although I did comment on a few facts and answered some questions. Karen, who put the whole camp

together, had wanted us to do a presentation about various objects like red giants, white dwarfs, black wholes, galaxies, etc. But time ran out and she said if the kids have any questions about those objects she'll have them email us, and we said that was fine. The scouts paid \$300.00. PAS received \$75, and the three of us each received \$75, which was for our time and gas, etc. There were about 50 kids and about 50 adults and everyone was very nice. They took all the cards we had and some wanted us to do star parties in the future. One sounds interesting, being planned in Flagstaff and going to meteor crater. We also handed out literature about the ASU Planetary Science program coming up on October 24th that is free and fun for the kids. ***

Thanks To Telescope Team From Seven Springs Scouts

Written by Karen Williamson

It was such a pleasure to have Mike, Sam, and Frank with us last Saturday night! The scouts will be writing a proper thank you during their next den meeting.

In spite of some cloud cover and a crowded schedule, the children were fascinated with the night sky, the solar flare, and the meteors. We owe you all the biggest thanks for going so out of your way to share

this experience with our boys, and all the families.

The news of the event made it back to our fifth grade science teacher who is now focusing on Astronomy! She was impressed with the excitement this viewing created in the older scouts.

We are hoping that we can get on the schedule for next year; Saturday, October

2, 2010 at the same campground, the Cave Creek Group Site. Catherine Gates will be the Chair and you can email the confirm to her. I imagine it will be the same program only we need to adjust our scheduling a bit.

Again, many, many thanks for the fabulous gift you have given our children: the starts and the moon and the planets! ***

Viewing NASA's Bombardment of the Moon

Bob Christ

In preparation for future space missions, NASA bombarded the Moon to detect for water, in some form, within the ejecta. Water would help sustain life on a moon-based settlement, and the hydrogen able to be extracted from water molecules could be used to produce rocket fuel for extended missions to targets such as Mars.

The initiative was titled: LCROSS (Lunar Crater Observation and Sensing Spacecraft) and occurred at approximately 4:31:19 MST on Friday, October 9, 2009.

I was fortunate to visually see the results of the impact of Comet Tempel 1 on July 4, 2005 from a hilltop at Dewey, AZ, so I thought the LCROSS impact would be a lot easier given the event's closeness to Earth at ~ 220,299 miles away at the time of impact.

Actually there were two impacts: the first one by a 2-ton, bus-sized object named Centaur into the Cabeus Crater on the Southern limb of the Moon at break-neck speed near the terminator. A second impact occurred as Centaur's "Shepherding Spacecraft," the craft that shot Centaur into the Moon, sacrificed itself as it flew through the impact's ejecta plume to collect data before it too crashed into the crater at about 4:35:45, about 4 minutes later.

NASA expected the plume to reach a height of 5-9 miles although a portion would remain invisible within the depth of the crater, forever hidden from the Sun's rays. I had calculated (see formula below) that my 9.25" telescope could resolve objects on the Moon down to 1/2 (.5) mile in size and it was then a matter of achieving the correct magnification to view the event Not to mention benefiting from an accommodating sky.

I set up the scope early Thursday evening so I didn't have to worry about aligning it just prior to the event. Jupiter was well positioned and the Great Red Spot (GRS) was centered at 7:24 PM so at that time I slewed the scope to Jupiter.

Steady seeing is an important viewing consideration and only on occasion could I make out the two major equatorial bands. Oh boy, the seeing is not good, and hopefully it will stabilize by impact time. I also peeked at Mars and it too was washed-out, revealing no detail. "Oh boy" is worth mentioning again.

Time to go to bed – alarm set to jolt me at 3:45 AM – and it worked.

In preparation to view the impact: I had researched the impact area and printed charts so I could be sure to point the scope to the correct area, I set the scope to Lunar tracking, and I positioned the target area in the outer edge of the field of view to minimize the effect of the 71% illuminated Moon's brightness. The seeing had not improved and the Moon's craters were doing a serious St. Vitus Dance. Undaunted, I continued to prepare and found I couldn't even take the scope up to 200x. I am prepared as best as I can be and filled with anticipation and optimism – but oh boy, the seeing is not good.

I glued myself to the eyepiece at 4:25 in case the impact window had change slightly and remained vigilant until 4:45. Nothing. nada, zilch. Was I scoping the wrong area (no), did the seeing obscure the event (perhaps), did I have enough magnification (don't know), and did the event even happen? I went inside, logged onto the Web, and discovered the event indeed did happen as scheduled.

Deflated, I kept thinking – what did I do wrong? Several hours later the chatter

on AZ-Observing@freelists.org began to roll in. Using scopes ranging from 8" to 24", no one in the Valley had seen the plumes. Some folks even had stable seeing that allowed them to take scopes up to 450X. Later, taken from CNN.com: "But immediate NASA images of the crash produced no sign of the plumes, which were expected to rise six kilometers from the moon's surface, said John Marmie, LCROSS deputy project manager. Everyone was like, 'What's happening here?' Marmie said. But that doesn't mean we don't have good data there."

Feeling vindicated, I reflected back on my preparation for the event and attempt to view it. Yes, it would have been most fulfilling to view plumes but I will fondly remember the opportunity and process to participate in the LCROSS venture.

The formula to calculate the smallest object your telescope can resolve on the Moon is:

$$S = D \times (R / (3600 \times 180 / \text{Pi}))$$

S = Size of the smallest object observable on the Moon using your telescope

D = Distance of the Moon from the Earth in miles

R = The Dawes Limit of your telescope (divide your scope's aperture, in inches, into 4.56)

To do the calculation:

Step 1: Divide 180 by Pi (3.14) and multiply the result by 3600 (answer is 206,369)

Step 2: Divide that answer into the Dawes Limit of your scope

Step 3: Multiple that answer by the distance to the Moon

The resulting number is the smallest object, in miles, on the Moon viewable through your telescope.

PAS Indoor/outdoor Astro Event 10/15 Review

By Terri, Event Coordinator

Photos for this event are in the Photo Gallery on the PAS website at:

http://www.pasaz.org/forums/gallery.php?g2_itemId=4423

What a lovely night for an event outdoors. We had a great turnout. We took in 2 new

PAS members at this event. I don't recall the second one but Bruce & Sherry joined the club that night.

I wish to thank the Indoor group for their assistance. Mike, like usual stole the show. I did a few demo items but I wasn't the main Indoor attraction. Mike was. I wish to thank Ed for helping to sell the PAS T-shirts. We sold 4 that night. More money for the club. And I wish to thank William and Bette for taking photos of the event. I eventually took one camera around as well. The photos can be seen at the link above. Enjoy!

Outdoor portion, the weather was absolutely awesome! We had a crowd around the

telescopes. Don set up his scope, Bruce bring his 20", and of course, Dennis with his 28" was the highlight of the evening. I wish to thank all the telescopes who were out side that night.

Many thanks to all the attendees. We only had 3 public RSVP's but about 25-30 public were there. It was a very busy, fun, educational night. We didn't see any children this time. That's unusual. Thanks to everyone for helping out & attending. Let's see you at the next event in April 2010!!! ***

Arizona Sky



In November, the autumn constellations of Pegasus and Andromeda take center stage, between the summer triangle that is still visible in the west, and the winter circle that is starting to rise in the east.

The Andromeda Galaxy, highlight of the autumn sky, is easily visible with a small telescope or binoculars. In very dark skies, it can even be seen without a telescope as a “fuzzy star”, making it the most distant object visible with the naked eye. In fact, it was observed with no optical aid and recorded by the Persian astronomer Al Sufi in 964. Charles Messier added it to his list in 1773 as M31.

This beautiful spiral galaxy, our galaxy’s nearest neighbor, is about 2.5 million light years away, and about 150,000 light years across. It is the most luminous member of our “local group”, which includes about 40 galaxies (mostly small ellipticals). In views by professional telescopes such as the Hubble, M31 appears to have a double nucleus with a large black hole (although the double nucleus might be an optical illusion caused by dust blocking part of a single nucleus).

M31 is one of the few galaxies that shows a “blue shift” rather than a “red shift” – or in other words, while most galaxies are speeding away from us, M31 is moving towards us at a speed of around 80 miles/sec. At this rate, it should be arriving in around 6 billion years. (Mark your calendar!)

M31 has about 15 satellite elliptical galaxies, of which the two brightest are M32 and M110. It also has many globular clusters, some of which can be seen in an amateur telescope.

M32, a bit south of M31, is only about 6000 light years in diameter. We see it as a “compact elliptical” galaxy with a very bright core; but once it might have been a spiral galaxy, whose spiral arms were lost due to gravitational interaction with M31. M32 was discovered by the French astronomer Gillaume le Gentil in 1749.

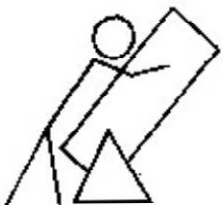
M110, north of M31, has a diameter of 10,000 light years. It apparently had a burst of star formation about 500 million years ago, ending a few million years ago. In our view today (in which we see the galaxy as it was 2.5 million years ago – the time that it takes for the light to reach us) the interstellar gas is rotating but the stars are not. All these phenomena could be due to previous interactions with M31.



Andromeda Galaxy and its companions M32 (bottom center) and M110 (top right)



Pinwheel Galaxy with star-forming regions NGC 604 (top left) and NGC 595 (above/right of center)



Interestingly, M110 was recorded by Charles Messier in his drawing of M31 in 1773, but he did not recognize it as a separate galaxy. Caroline Herschel independently discovered it in 1783,

and it was included in the NGC catalog as NGC 205. The galaxy was included in the Messier list only in 1967. (Messier’s original list included just 103 objects; M104-110 were added to the list later, based on Messier’s notes.)

About 15 degrees southeast of M31, and 4 degrees west of the vertex of Triangulum, is another prominent member of the “Local Group”: M33, also known as the Pinwheel Galaxy (although it shares this nickname with two other

Arizona Sky

Messier galaxies). As its name suggests, this is a face-on spiral galaxy. Its low surface brightness makes it harder to distinguish than M31, which is larger, and partially edge-on. M33 is only 60,000 light years in diameter.

Like our own Milky Way, M33 has large star-forming regions, including several that have been catalogued separately. (Two of them – NGC 604 and NGC 595 – can be seen in the photo.) In these regions, hot new stars are ionizing hydrogen gas and making it glow, just as in the bright nebulae of our own galaxy, such as the Orion Nebula. NGC 604 and NGC 595 are huge, however – each is over 100 times as large as the Orion Nebula.

And so, the autumn sky gives us a view of the three largest members of our Local Group. M31 is the largest and M33 is the third-largest. Which then is the second-largest galaxy? You can see traces of it behind Cygnus and Cassiopeia: our own Milky Way!

About 15 degrees west of the Andromeda Galaxy, but much closer in reality, is a beautiful planetary nebula known as “The Blue Snowball” (NGC 7662). It is about 4000 light years away and only about 1/3 of a light year in diameter – quite small for a planetary nebula, which are

usually about 1 light year across. Its small size indicates that it is probably younger than most other planetaries.

Photographs of the nebula show a double ring structure: the inner ring is brightened by a spherical shock wave, while the outer ring is illuminated by UV light from the central star, which ionizes the gas in this layer. At the two sides of the nebula are “FLIERS” (Fast Low-Ionization Emission Regions) which are thought to be younger than the rest of the nebula. They might be composed of newly ejected material from deep inside the central star, cast out separately from the other layers of the nebula, in a powerful event that brought them to the nebula’s edge. The “FLIER” on the left is more prominent than the one on the right, but in all nebulae where these features exist, they tend to come in pairs.

Back in the solar system, Jupiter, Neptune, and Uranus are high in the south at sunset, and beginning to set earlier. Jupiter and Neptune set around midnight at the beginning of November, and around 11 pm towards the end of the month. Uranus follows them by about 2 hours.

Mars is now rising around 11 pm, and is only slightly larger and closer than last month. Saturn is also rising earlier – around 4 am at the

beginning of November, and 2 am towards the end of the month. But Venus and Mercury, which have been morning stars for a while, will be fading into the sunrise. Venus is still visible just before dawn, but Mercury is gone and won’t be seen till it reappears as an evening star next month.

The full moon and the Pleiades will cruise across the sky together on November 3-4, and on the following night the moon will be close to the Hyades. On November 8 and 9, Mars and the 3rd quarter moon will be in the east after midnight; and on November 12, Saturn and the moon will be in the east before dawn. On November 23, Jupiter and Neptune will make a nice triangle with the crescent moon in the west after sunset.

November brings us the Leonid meteor shower, which should be putting on a good show this year. The earth will be passing through a thicker stream of particles, and the new moon won’t be interfering with the view. So, dress warmly and watch for meteors on the night of November 17-18!

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



Blue Snowball Nebula



Staring at Lightning

There's something mesmerizing about watching a thunderstorm. You stare at the dark, dramatic clouds waiting for split-second bursts of brilliant light — intricate bolts of lightning spidering across the sky. Look away at the wrong time and (FLASH!) you miss it.

Lightning is much more than just a beautiful spectacle, though. It's a window into the heart of the storm, and it could even provide clues about climate change. earth_lightning. The Strong vertical motions within a storm cloud help generate the electricity that powers lightning. These up-drafts are caused when warm, moist air rises. Because warmth and lightning are inextricably connected, tracking long-term changes in lightning frequency could reveal the progress of climate change.

It's one of many reasons why scientists want to keep an unwavering eye on lightning. The best way to do that? With a satellite 35,800 km overhead.

At that altitude, satellites orbit at just the right speed to remain over one spot on the Earth's surface while the planet rotates around its axis — a “geostationary” orbit. NASA and NOAA scientists are working on an advanced lightning sensor called the

Geostationary Lightning Mapper (GLM) that will fly onboard the next generation geostationary operational environmental satellite, called GOES-R, slated to launch around 2015.

“GLM will give us a constant, eye-in-the-sky view of lightning over a wide portion of the Earth,” says Steven Goodman, NOAA chief scientist for GOES-R at NASA's Goddard Space Flight Center. Once GLM sensors are flying on GOES-R and its sister GOES-S, that view will extend 18,000 km from New Zealand, east across the Pacific Ocean, across the Americas, and to Africa's western coast.

With this hemisphere-scale view, scientists will gather an unprecedented amount of data on how lightning varies from place to place, year to year, and even decade to decade. Existing lightning sensors are either on the ground — which limits their geographic range — or on satellites that orbit much closer to Earth. These satellites circle the Earth every 90 minutes or so, quickly passing over any one area, which can leave some awkward gaps in the data.

Goodman explains: “Low-Earth orbit satellites observe a location such as Florida

for only a minute at a time. Many of these storms occur in the late afternoon, and if the satellite's not overhead at that time, you're going to miss it.”

GLM, on the other hand, won't miss a thing. Indeed, in just two weeks of observations, GLM is expected gather more data than NASA's two low-Earth orbiting research sensors did in 10+ years.

The new data will have many uses beyond understanding climate change. For example, wherever lightning flashes are abundant, scientists can warn aircraft pilots of strong turbulence. The data may also offer new insights into the evolution of storms and prompt improvements in severe weather forecasting.

Staring at

(FLASH!) Did you miss another one? The time has come for GLM.

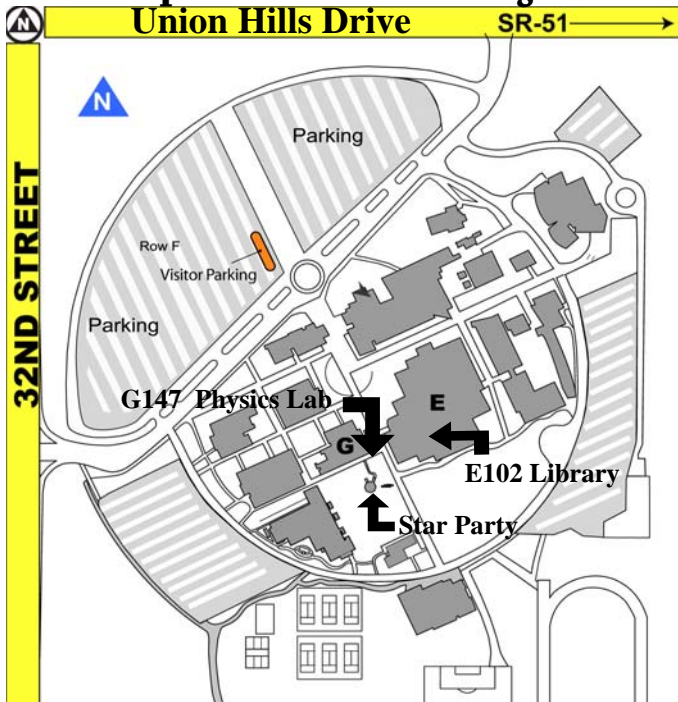
Want to know how to build a weather satellite? Check the “how to” booklet at scijinks.gov/weather/technology/build_satellite.

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



The Geostationary Lightning Mapper (GLM) on the next generation of GOES satellites will detect the very rapid and transient bursts of light produced by lightning at near-infrared wavelengths. This image was taken from the International Space Station and shows the Aurora Australis and lightning.

Map to PAS Meeting



Paid Star Parties

By Terri, Event Coordinator

Are you a PAS Member? If you are, you can get in on the PAStimes Star Tours group. We are a bunch of PAS Members who wish to make some money showing the night sky. To sign up for the Star Tours group, you need to contact Terri, that's me, and let me know you wish to be part of the Telescope TEAM. Then, watch the Private forums and Private Calendar for upcoming opportunities to get paid to do what you love, share the night sky. Sign up today! ***

AZ Cardinals Prep Academy School Star Party

By Terri, Event Coordinator

Volunteers are needed for this whole school star party. It is just down the street from me around 19th ave and Butler. If you can assist, please let Terri know (by phone if you do not have internet or on line in the Private Calendar) so we can make plans to show this school a great evening of viewing. This happens to be my daughter's Birthday, too. HAPPY BIRTHDAY AMANDA! ***

November

See page 2 for more information

| Sun | Mon | Tue | Wed | Thu | Fri | Sat |
|-----|--|-----|-----|------------------|---|--------------------------|
| 1 | 2 | 3 | 4 | 5 PAS Meeting | 6 | 7 |
| 8 | 9 | 10 | 11 | 12 | 13 | 14 |
| 15 | 16 | 17 | 18 | 19 MOM | 20 AZ Cards Prep Academy School star party | 21 VIRTUAL STAR PARTY |
| 22 | 23 Imagine Elementary school Star Party | 24 | 25 | 26 | 27 | 28 |
| 29 | 30 | | | | | |

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 for Fall 2009

By Terri, Event Coordinator

Nov 5: Dean Salman – Topic: “Remote Automated Observatories for CCD Imaging” - <http://ccdimages.com/default.aspx>

Dec 3: Ken Herkenhoff - “CCD imaging from the Mars Exploration ***

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What’s Up For November?

By Rod Sutter, PAS President

Planets

| Name | Date | Rise | Set |
|---------|---------|-------|-------|
| Mercury | 11-1-09 | 07:20 | 17:51 |
| Venus | 11-1-09 | 06:02 | 17:17 |
| Mars | 11-1-09 | 23:41 | 14:13 |
| Jupiter | 10-1-09 | 14:39 | 00:42 |
| Saturn | 11-1-09 | 04:12 | 16:29 |
| Uranus | 11-1-09 | 16:07 | 03:49 |
| Neptune | 11-1-09 | 14:51 | 01:12 |
| Pluto | 11-1-09 | 07:32 | 17:56 |

All Times Arizona Time

Nov 15 2009

Sunrise: 06:58

Sunset: 17:26



Full:November 2



Q3:November 9



New:November 16



Q1:November 24