

PAStimes

Newsletter of the
Phoenix Astronomical Society
www.pasaz.org

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PHOENIX ASTRONOMICAL SOCIETY — ESTABLISHED 1948

Next Meeting: 7:30 pm, Thursday, November 3rd

Our November lecture features the long-overdue return of Dr. David Burstein of ASU. His lecture topic is "The History of Astronomy." Burstein teaches the course "Normal Galaxies" at ASU, and has published many articles related to spectroscopy and cosmology. Read more about Dr. Burstein inside.

PVCC's Library is open all day. PAS members with business to conduct, new members with paperwork to complete, or those who simply want to socialize, are asked to arrive early. PAS Officers are generally onsite by 7:00 pm. As a courtesy to our speakers, meetings will start promptly at 7:30 pm. ★

Last Meeting: Thursday, October 6th

Dr. Fulvio Melia amazed us with his latest research on the black hole at the center of our galaxy. Melia believes the next generation of instruments will be able to actually image this object.

He began with a review of the history of "energetic objects" starting with quasar 3C273 and ending with the Milky Way's own central black hole.

We watched an amazing computer simulation of a fly-by of the black hole. It was compiled from over 300 hours of rendering on a supercomputer. That was followed by a short, time-lapse, video of real IR images of several stars near the black hole. Some 13 years of images were sequenced into this video. It clearly showed gravitational control by a small and massive, yet invisible, central body.

In his concluding remarks, Dr. Melia was optimistic that the next generation of IR imaging instruments would have sufficient resolution to show the event horizon of the black hole. Computer simulations of the IR image predict the black hole will show as a darkened ellipse, with background star fields gravitationally dragged around the leading limb.

PAS thanks Dr. Fulvio Melia for an awe-inspiring journey to the center of the Milky Way! ★



Dr. Fulvio Melia points out the implications of well-known quasar 3C273. It was the starting point for his discussion of "energetic objects."

He provided a wealth of multimedia to support his ideas, including images, videos, and simulations. Note the use of our new PAS custom lectern, with cardioid mike and laptop support.



Dr. Melia had copies of both his books ("The Black Hole at the Center of Our Galaxy," and "The Edge of Infinity: Supermassive Black Holes") for sale at the end of the program. Here he writes a personal message to a fan. This was a rare opportunity to get the autograph of the astronomer who may be the first to see the Milky Way's central black hole!

November Events:

- 11/1: Meeting of the Minds (from Oct 27), new location: 10401 N. Cave Creek Road, SE corner at Peoria, enter gate and make a right uphill, watch for signs, 7 pm
- 11/3: PAS Lecture Meeting at PVCC, David Burstein is our speaker, 7 pm
- 11/4: PAS Adult Night Out at ASC, 6 pm, volunteers and scopes needed
- 11/5: Mars Party at Barb's, members only and potluck, 6 pm (RSVP to Barb)
- 11/7: Star Party at Foothills Academy, SW corner of Scottsdale Road and Ashler Hills, 6-8 pm (1-2 volunteers still needed)
- 11/10: Mars Party at PVCC, 6-10 pm, setup 5:30, volunteers and scopes needed
- 11/14: Star Party at Arrowhead Elementary, 3820 E. Nisbet Road, 2 blocks S of Greenway, 5 pm (volunteers and scopes needed)
- 11/17: PAS Meeting of the Minds at PVCC, 7 pm
- 11/22: ASU West Star Party & Open House, 6 pm
- 11/26: PAS Shallow Sky Public Star Party, TBA

Meet Dr. David Burstein

My goal as a scientist is to try to understand the structure and evolution of galaxies, as a means of understanding the structure and evolution of the universe. In so doing, my work ranges from studies of stars and the distribution of dust in our own galaxy, to the stellar populations of other galaxies, to the physical structures of galaxies, to the large-scale structure of the universe as defined by galaxies. Currently, my students and I are working on several topics, including defining better the line of sight reddening zero point in the Galaxy; obtaining accurate spectrophotometry from 1200\AA to 1μ of stellar spectral standards for galaxy population studies; using a telescope in Xing Long, China, to study the properties of galaxies; better understanding the role of hot gas in galaxy groups and clusters. There are many things we still do not understand about galaxies and the universe at large, and much work still to do.

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Selected Publications:

Burstein, D. and Heiles, C., Maps,"Reddenings Derived from HI and Galaxy Counts: Accuracy and

Maps," A.J. 87, 1162-1187 (1982) This is the most cited paper in astronomy, 1981-2002.

Lynden-Bell, D., Faber, S.M., Burstein, D., Davies, R.L., Dressler, A., Terlevich, R. and Wegner, G., "Spectroscopy and Photometry of Elliptical Galaxies: V. Galaxy Streaming Towards the New Super-galactic Centre," Ap.J. 326, 19-49 (1987). This paper describes the discovery of the Great Attractor by the 7 Samuari astronomy group.

Burstein, D., Bender, R., Faber, S.M. and Nolthenius, R., "Global Relationships Among the Physical Properties of Stellar Systems," AJ. 114, 1365--1392 (1997) Showing that all stellar systems, from globular clusters to galaxies to galaxy groups to galaxy clusters, are physically related, and plausibly interpreted in terms of the hierarchical-clustering-merging paradigm.

Captain's Log:

By Terri Finch

Meeting of the Minds Review - Oct 4: This was a super productive meeting. We had Dave Hellman sitting in on the session with us, instead of Ed Rosenthal this time, both from PVCC. We had some really good discussions and here are some of the results of that meeting. I must thank everyone who attended and inputted ideas. We has some very tough topics to cover. I'm only going to cover those topics here that readers need to know about.

May Meeting - Speaker or Observing Session? I got to thinking that since we are holding our meetings at PVCC and we have use of the Library for these meetings, for the speakers, that we might want to consider having a May Speaker instead of the normal Observing Session. So, I'm putting this idea out to everyone. The idea is to get this situation pinned down with enough time to fill in a speaker if needed. I have someone who is interested in doing a presentation on Meteorites. If you think that would be more interesting than an observing session and you'd attend the meeting because of it, them let me know so that we can make arrangements to have that speaker. Remember also that the May meeting is our Elections. Although elections won't take more than 1/2 hour, we could hold them prior to the speaker, or just after the speaker. Give me your input. We are letting the PAS Membership make the choice. Let me know what you think. I'll be taking a tally as people contact me with their ideas. Speaker or Observing Session? And can you bring many people to attend this meeting if we do either? The other idea that came of this was that maybe we

could hold our elections at the MOM prior to the MAY Meeting. BUT, CAN YOU ATTEND THE MOM to help vote on the new officers? If not, then we have to do it at the May meeting. Let me know your thoughts on this as well.

Two Speakers fall on a Friday: We were discussing a location change for the 2 speakers we have in 2006 that fall on a Friday date rather than a Thursday. That would be our February meeting and our April meeting. And the location change would have to be someplace other than PVCC. I've asked ASC if they can accommodate us and haven't heard back yet. I'd rather have the speaker than not, so I let them take a Friday for their presentation night. If you have an idea where we should hold those 2 special meetings, let me know. I have Rod and Dave researching a place for us. Hopefully someplace can be pinned down for those dates soon. Thanks for the research! Ideas are still welcome.

NASA's Outreach Toolkit - Barbara's in Charge: Barbara received the toolkit prior to the MOM. This is some kit. Awesome. 5 projects are included. Now what we need is some NON telescope folk to come work with the kids on doing these projects. I'm hoping DISA can assist in this project on a regular basis. Anyway, we are working on a group activity with this. And we need anyone who can be at the star parties with or without their telescope to commit to being part of the team that will do these projects with us. We have, so far, Don, Barbara, and Terri. We'd like to have Rod and maybe Dave also involved. This doesn't mean you have to make it to EVERY star party. It means that when you are at one, you assist us in answering questions the kids may have, showing them something cool in your scope, maybe being in the PUNCHING group. It did sound funny to call it that. But that's what you end up being for one of the projects. So, if you are interested in helping out at as many star parties as you can, especially ones having to do with school groups, then let me know so we can get this going. Thanks.

PASAZ.ORG: If you haven't been to our website in a while, check it out. Barbara has been doing a splendid job of keeping it updated. Anytime I have a change for the site, I see it within a day or so, up there, ready for the public to see. She is keeping on top of it so well... THANK YOU BARBARA.

This comes to you because I have had several people ask me about the meeting location being at PVCC, not realizing that our current Webmaster is doing such a spectacular job at keeping things updated, that they only need to visit the site to know



PAS members chat before the meeting. Don, Terri, and Barb are discussing current astro events.

There's always time for friendly conversation if you arrive before the star of the lecture. Who knows ... you just might be the holder of the winning 50/50 raffle ticket. Note that Dan never wins.



PAS Treasurer, and resident meteor-meister, Mike Marron, shares his NiFe's with an unidentified PVCC Astronomy Club member. John Pulis looks on and considers a bid on that particular rock.



This photo, by Barbara Hartman, shows attendees at the Sep 29 New River Elementary Star Party. It was a great night viewing, with close to 100 people participating. Students, parents, and teachers were all thrilled by views of the night sky.

what is happening with PAS. Now you know, so check the site often. In fact, the site is the most accurate list of events, even more up to date than the newsletter. Let's see you at more of our events now that you know what PAS is doing every minute of the day. The only exception is the star party is with only a day's notice. Then we have difficulty getting it on line. But everything else has been posted with plenty of time to check it out, and be there. Also watch the website for Cancelled star parties due to weather.*

PAS HOLIDAY SOCIAL: It's just around the corner. As the holidays come upon us, we have to remember to grab that special gift for the PAS Social's White Dwarf Gift Exchange. And what should you get for this year's event? Think it over carefully. We are asking that for this event you bring a gift (if you wish to be involved in the White Dwarf Gift Exchange) that ranges in price from \$1 to \$20. We would rather you give a gift you would like to receive. So, if it is a movie, pick something astronomy related that you think would be a good thing to pass along to another PAS member. If it is a book, in good condition, useful, preferably aimed at ADULTS, and informative. In attendance, for those who haven't ever been to this social before, will be mostly, I'd say 98% of everyone there, are ADULTS. So, plan your gift for something that an adult could use, or enjoy, or want. So, for instance, last year we had an awesome Sun Dial, there was also a Sun Clock, and some physics related fun stuff with magnets or balancing items, like you'd find at the Awesome Atoms store at the Arizona Science Center. Now, you can spend more than \$20 per gift, but we rather you just pick something that really would be nice for an adult who loves astronomy. Now, once you have that gift, please disguise it. Make it bright, shiny, fancy, attractive on the outside, maybe make it heavier than it is, or trick someone into wanting it by putting some kind of teaser on the outside of the box. Wrap it so that it won't fall apart if handled. Remember, the game involves stealing gifts. And also, if it is FRAGILE, please mark on it that it is so that no one shakes it. If you find you can't afford a gift that is extremely interesting, try including a box of several little things. Red filtered flashlights are useful to astronomers, an astronomy related hat, shirt or jacket, glow in the dark items, star charts, reference books, computer programs. Remember, this is a friendly exchange. Everyone who gets involved with the gift exchange is bound to have a fun time. Last time we exchanged several times and had a blast. Some of us laughed so hard it

was an amazing night. The PAS Social is scheduled for a particular time in January when there isn't much in the way of Holiday stuff going on any more. We don't hold it in December because everyone is way too busy to come to Dan's home, Heimhenge, during the holiday rush. So, plan to be there. Watch for the announcement of when it will be and let's all have a fantastic time. Please make your gifts anonymous. There should be no way, except for me since I may see you put them on the gift exchange table, that anyone should know which gifts you brought. Unless you really want to let someone know. You can put a tag in the box with the gift that says it is from you. You are their Secret Santa. But most of us stay anonymous because it is fun that way. You'll never know what you will get. Oh, and if you got something last year that you can not use, add another gift to it, and put the two of them in a box for someone else. Sometimes, we get gifts that aren't useful to us, for instance, let's say the gift was an eyepiece for a telescope and you don't have a telescope. You could put that gift in a box with a star chart and give it away this year to hopefully someone who can use it. So, start looking around. Find that gift and let's have a laughing good time this year for the PAS Holiday Social. You will definitely want to attend.

PAS DUES: Have you paid your dues? Remember, they are due by the end of October to make Mike's job easier. This is also because, by January, we really want to include everyone who has paid their dues in the current PAS 2006 Membership Roster. We can't do that if you haven't paid up, on time. Those of you who are renewing, should already have done so. Please check your records and get that money off to Mike, or bring it to the next PAS meeting. It is important that you are paid up on time.

MAY MEETING VOTING: At the Meeting of the Minds, the group was discussing what we should do for our May PAS meeting. Our usual is to open the meeting, do the election of officers, and then do an observing session outdoors for the rest of the evening. This, however, would be a bit more difficult at PVCC as we'd also want to park, go to the library for the elections, then pack up everything, move our cars to the observing spot, unload, set up, etc. It isn't as convenient as it was when we did it at Valley Academy. So, we are tossing the idea around of changing the format for the May meeting while we stay at PVCC. And we want your input.

Anyway, these are the ideas that came from the last Meeting of the Minds. We have plenty of time to

choose which option, but if we do it as a vote, then who ever is in attendance at that meeting when we vote, will help make the decision. And if we vote for a speaker, I'd like to be able to tell our speaker that he should have his talk prepared by the May meeting. So, here are the ideas that came up and you pick what we will do. Give me a call with your idea, or tell me at the next meeting... You are voting on these ideas: 1) Have elections and have a speaker for an hour or 2) Have elections and then have an observing session or 3) Have elections and then have a socializing time, maybe move our party to a location they serve food, like Denny's. Give us your ideas. We will make the final decision on this idea at the next Meeting of the Minds.

MEETING OF THE MINDS LOCATION for NOV 1, 7pm 10401 N Cave Creek Rd. Cave creek Rd and Peoria just south, on the East side of the road - Enter the gate and make a right up the hill. I will post signs at the day of the meeting so everyone can find it easier.

NOVEMBER MEETING OF THE MINDS: Please plan to be there if you want to help PAS make these decisions. Below is a list of what we are discussing at the next meeting of the minds on Nov 1. And the location has been changed, so please make a note of it so you can come.

MEETING OF THE MINDS AGENDA: Nov 1, 2005 7pm 10401 N Cave Creek Rd - Enter the gate and make a right up the hill. I will post signs at the day of the meeting so every one can find it easier.

- April & February PAS meetings Fridays Location
- Shallow Sky Star Party Locations Needed
- Piggyback MOM and PAS on same night?
- Hostess situation
- Bathrooms and Soccer Field idea for * Parties
- May Meeting voting: 1) Have elections and have a speaker for an hour or 2) Have elections and then have an observing session or 3) Have elections and then have a socializing time, maybe move our party to a location they serve food, like Denny's.
- MOM Potluck at Rod's location
- Beginner's Star Party Dates
- Paul's presentation: Option 1: THE MYSTERIOUS X-RAY STARS Option 2: photometry surveys like MACHO and OGLE - I do a lot of "data mining" from these publicly available sources. If the meeting room has a computer and internet hookup, I could show a whole bunch of stuff.
- Star Party Location: 40th St and Paradise Ln 5:30 am to 10:00 PM*

Over and out. —Terri ★

Stars of PAS:

By Terri Finch

Do you know who the STARS of PAS are? These are the people who volunteer with or without a telescope to help PAS promote astronomy.

NEW RIVER STAR PARTY REVIEW, Thurs Sept 29th, written by Rod Sutter: What a great star party. Excellent turn out, there must have been 100 kids and parents at the star party. Everyone at the school was thrilled by the views from our scopes. The few teachers that I talked to said they hope we can come back again. We had 3 Scopes and 2 Binos and Mike with his poster and meteorites. Rod, Dave and Scott had their scopes, and Barb and Dan brought their Binoculars. I thought the best thing was each time I had a child and his parent come to look thru the scope, after about the 5th or 6th little one, I'm talking maybe 6 or 7 years old, I learned to tell the child, before he looked thru the scope to make sure he or she had their eyes open. One little boy came up with his mom, she held him up and I showed him where to look thru. After a few seconds I asked him do you see the stars? His remark was no, it's too dark, then I asked him are your eyes open? I had to tell each little one keep their eyes open.

TEMPLE BETH ISRAEL STAR PARTY REVIEW, Oct 21: It was an awesome night for a star party. Rod shot some photos, that I hope make it into this issue. We had a great turn out. I would guess that for the party there were equal amounts of adults and children, and there must have been close to 200 of them. Rod and Sue, William and Terri, Bruce, Mike, Dave Owings, and a new couple, Paul and Rachael, came to help out with scopes. The sky was cooperative, no clouds all night long. The one thing we did have was lots of dew. We first all put our scopes on Venus. Then Mars came up for viewing. Rod was able to find the Andromeda Galaxy. Finally some of the lights were turned off. We were very glad, and then we were able to find some other items. I found the Perseids Double Cluster. About 1/2 hour after we could finally get some good viewing, the party broke up and everyone was headed home. I showed LaDien some items, Perseids Double Cluster, Andromeda, Mars and the Ring Nebula, and then I packed it in. It was a very successful evening, we all had fun. Thanks to everyone! And Thank you to Temple Beth Israel for inviting us to their party. This is our second year doing this event for them. We hope to enjoy it again with them next year. ★

From the NASA Space Place: A Wrinkle in Space-Time

by *Trudy E. Bell*

When a massive star reaches the end of its life, it can explode into a supernova rivaling the brilliance of an entire galaxy. What's left of the star fades in weeks, but its outer layers expand through space as a turbulent cloud of gases. Astronomers see beautiful remnants from past supernovas all around the sky, one of the most famous being the Crab Nebula in Taurus.

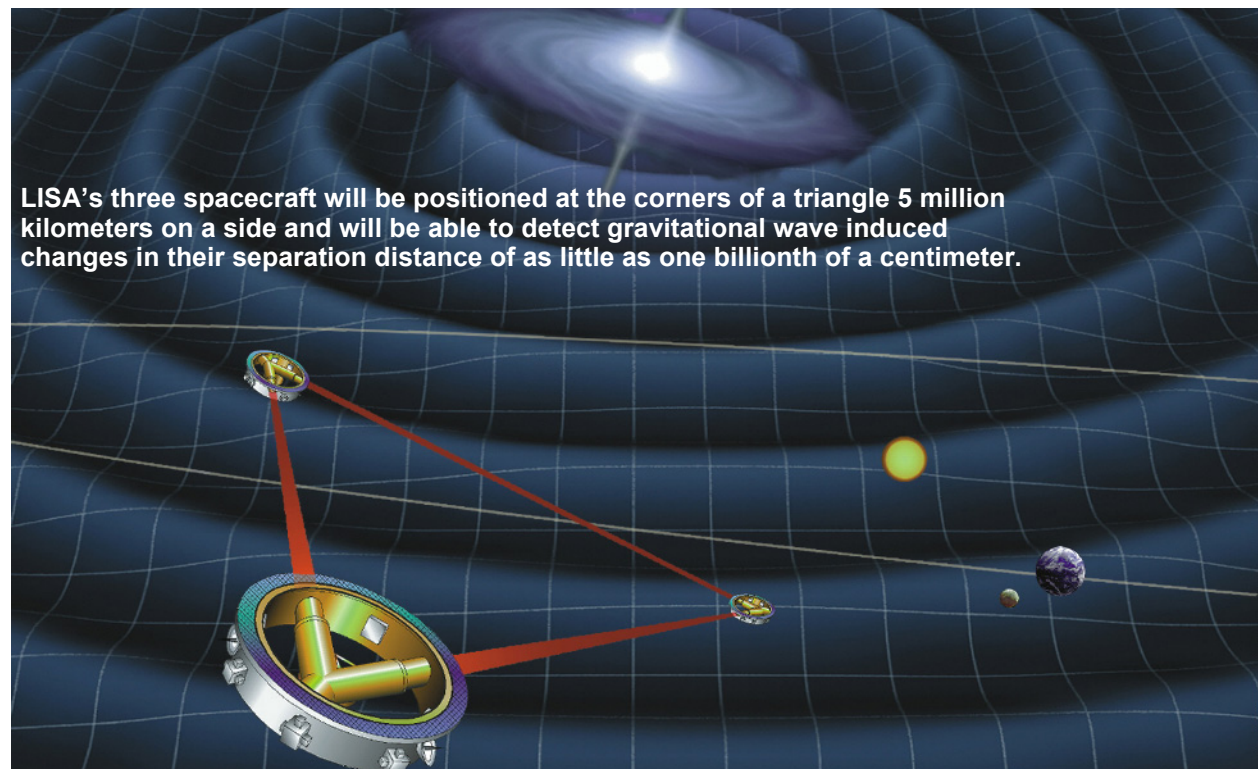
When a star throws off nine-tenths of its mass in a supernova, however, it also throws off nine-tenths of its gravitational field. Astronomers see the light from supernovas. Can they also somehow sense the sudden and dramatic change in the exploding star's gravitational field? Yes, they believe they can. According to Einstein's general theory of relativity, changes in the star's gravitational field should propagate outward, just like light—indeed, at the speed of light. Those propagating changes would be a gravitational wave.

Einstein said what we feel as a gravitational field arises from the fact that huge masses curve space and time. The more massive an object, the more it bends the three dimensions of space and the fourth dimension of time. And if a massive object's gravitational field changes suddenly—say, when a star explodes—it should kink or wrinkle the very geometry of space-time. Moreover, that wrinkle should propagate like ripples radiating outward in a pond from a thrown stone.

The frequency and timing of gravitational waves should reveal what's happening deep inside a supernova, in contrast to light, which is radiated from the surface. Thus, gravitational waves allow astronomers to peer inside the universe's most violent events—like doctors peer at patients' internal organs using CAT scans. The technique is not limited to supernovas: colliding neutron stars, black holes and other exotic objects may be revealed, too. NASA and the European Space Agency are now building prototype equipment for the first space experiment to measure gravitational waves: the Laser Interferometer Space Antenna, or LISA.

LISA will look for patterns of compression and stretching in space-time that signal the passage of a gravitational wave. Three small spacecraft will fly in a triangular formation behind the Earth, each beaming a laser at the other two, continuously measuring their mutual separation. Although the three 'craft will be 5 million kilometers apart, they will monitor their separation to one billionth of a centimeter, smaller than an atom's diameter, which is the kind of precision needed to sense these elusive waves. LISA is slated for launch around 2015.

To learn more about LISA, go to <http://lisa.jpl.nasa.gov>. Kids can learn about LISA and do a gravitational wave interactive crossword at <http://spaceplace.nasa.gov/en/kids/lisaxword/lisaxword.shtml>. This article was provided by the Jet Propulsion Laboratory, California Institute of Technology, under contract with NASA. ★



Astronomy Quote of the Month:

“One of the most impressive discoveries was the origin of the energy of the stars, that makes them continue to burn. One of the men who discovered this was out with his girl friend the night after he realized that nuclear reactions must be going on in the stars in order to make them shine. She said “Look at how pretty the stars shine!” He said, “Yes, and right now I am the only man in the world who knows why they shine.” She merely laughed at him. She was not impressed with being out with the only man who, at that moment, knew why stars shine. Well, it is sad to be alone, but that is the way it is in this world.”

— Richard Feynman, “The Feynman Lectures”

From your Editor:

by Dan Heim

At the last Meeting of the Minds we decided to pursue my proposed “PAS newsletter archive project.” Allow me to explain. Sitting on an office shelf behind me is a large cardboard box containing hardcopies of the PAS newsletter PASTimes (originally called “Sky Lines”) dating all the way back to the early 70’s.

What we want to do is scan these newsletters and create a digital archive thereof. There’s several good reasons to do this ...

1. The newsletter provides the best historical record of PAS available. There should be a digital archive of this record.
2. Moving the material to digital now preserves the content for future OCR (optical character recognition) processing. This would allow the creation of a text-searchable newsletter database.
3. Digital copies could be provided to members who want access to the newsletter archive. It’s a long and winding road, an interesting story, and a good read. And it’s our history!

As of this year, issues of PASTimes will accumulate as a text-searchable, digital archive online. But we still need to convert the old stuff.

If you have a scanner and know how to use it, and would like to share the workload on this project, let me know. I will add your name to my list, and at some future meeting deliver your scanning work. I’m guessing every participant might end up with 30-60 pages to scan (depending, of course, on just how many volunteer).

FYI, pages will be scanned at 300 dpi, grayscale TIF format. The image files must be burned to CD and returned to me for compiling. I await your response.

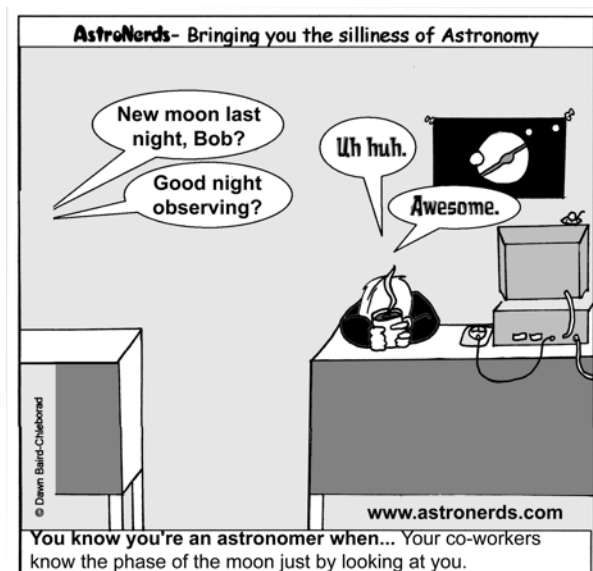
Thanks! ★

Astro Factoids:

from Bette Wurst

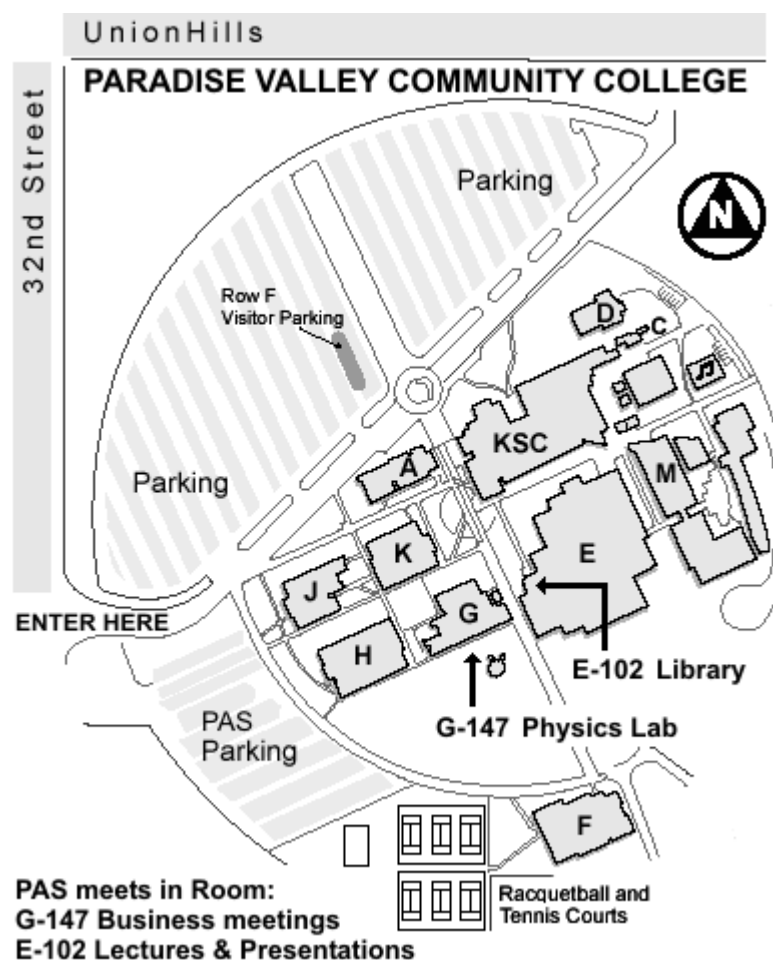
With few exceptions, stars that make up constellations usually lie at various distances from the Earth, only appearing to be grouped together because they lie in approximately the same direction. For example, the stars in the prominent autumn asterism the Great Square of Pegasus range from about 97 to 330 light years away. ★

Stars twinkle due to light passing through Earth’s turbulent atmosphere. This turbulence is caused, in part, by wind and changing temperatures. The more turbulence there is, the stronger the twinkling. If you were to observe the stars from the Moon, which has no atmosphere, they would not twinkle, but shine as steady points of light. ★



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MAP TO OUR MEETING LOCATION



November 2005

Sunset: 5:20 pm
 Sunrise: 7:05 am

-  **NEW: Nov 1st**
-  **Q1: Nov 8th**
-  **FULL: Nov 15th**
-  **Q3: Nov 23rd**

Astro Events:

Mars is still the "star" this month, with opposition on the 7th. Good viewing for another few weeks. Will there be a dust storm or not?

For all you asteroid hounds out there, note that Vesta (4) begins retrograde on Nov 19th. Opposition is Jan 5th. Look for it in Gemini.

Rarely providing a spectacular show, the S Taurid meteors peak in the pre-dawn hours of Nov 5th. Their sisters, the N Taurids, peak on the 12th. Lack of any Moon might make these worth a late night viewing.

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