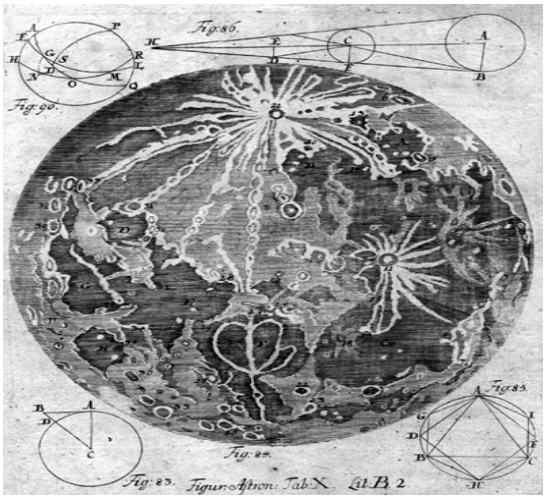

Next PAS Meeting 7:00PM
Thursday, February 3, 2005
PAS Social, January 22, 2005

*Volume LVII, Issue V*

# PAStimes

Monthly newsletter of the
Phoenix Astronomical Society
Founded 1948

PAStimes Internet Home Page: http://PASAZ.org
Join our Astronomy discussion group: http://groups.yahoo.com/group/PASAZ
PAS Email: phoe-

## ABOUT OUR DECEMBER SPEAKER

Dr. Nathaniel "Nat" White, Senior Staff Astronomer and Lowell Project Manager of the Navy Prototype Optical Interferometer (NPOI). Dr. White joined the Lowell Observatory in 1969. His major research interests includes cool stars and classification and the physical characteristics of cool supergiant stars as well as development of astronomical instrumentation. Dr. White developed high speed photometric systems which he used to measure the diameters of many stars, discover many close binary systems, and was first to measure the diameter of a supergiant in the light of H-alpha. In 1975, he was the first to apply the earliest home computers to control astronomical instrumentation. Currently he manages the operation of a large optical interferometer, a collaboration with the Naval Observatory. Dr. White earned the M.Sc. and Ph.D. from Ohio State University in Astronomy, a B.S.E.E .from Northern Arizona University, and a B.A. from Earlham College.***

*Lunar Eclipse photo by Barbara Hartman. Taken at 10:25 on 10/27/04 with a Kodak DX4900 4MP digital camera. The camera settings used were auto aperture, exposure, film speed (ISO) and macro focus. The flash was turned off and the white balance or exposure compensation was +2.0. Handheld to a 25 mm eyepiece on an Orion 6" Sky Quest Newtonian on a Dobsonian mount owned by my nephew, Jason Star in Waterford, NY.*

## OBSERVING THE FULL MOON

*by Charles A. Wood*
*from Sky & Telescope*

***Question***: When do many amateur astronomers leave their telescopes indoors? ***Answer***: the nights around the time of full Moon. After all, bright moonlight washes out faint galaxies and nebulae, and the Moon itself is too glaring to be observed . . . right? If you heard yourself say this, it's time to take your telescope outside during the next full Moon and begin exploring a world largely overlooked by amateur astronomers. There are numerous fascinating features to observe during this or any phase when you aim your telescope far from the terminator (the dividing line between lunar day and night). The Moon is very bright when it's full. If your magnified view of the lunar surface is a bit too dazzling for comfortable observing, use a Moon filter to cut the brilliance without eliminating detail. Because there are no shadows at full Moon, the dark and light areas you see are variations in the albedo (reflectivity) of different parts of the Moon. The biggest albedo difference is between the dark maria (the lunar "seas") and the light highlands. This is due to the compositions of the two surfaces. The maria are made of basaltic lava flows, much like those in Hawaii and Iceland. They contain iron, titanium and other dark metals. The highlands of the Moon are dominated by a bright, aluminum-rich rock called anorthosite. When you observe these light and dark regions, you're seeing rocks that resulted from fundamentally different processes of formation. If you look closely (even with your naked eye) at the maria, you can see that they're not all the same — Procellarum and Imbrium on the western half of the Moon are lighter than the majority of the lunar seas on the Moon's eastern hemisphere. A telescope shows the most conspicuous tonal contrast in mare darkness along the southern shoreline of Mare Serenitatis. The middle of the mare is lighter than the edges, which are noticeably darker. The difference is due to the age and composition of the lavas that comprise these two regions. The rocks found near the middle of Mare Serenitatis have 1–3 percent titanium oxide and are about 3.0 billion years old, while the dark border rocks contain less than 1 percent titanium oxide and are up to 500 million years older. Another type of dark marking visible near full Moon are small patches of volcanic ash — great examples are observable on the floors of Alphonsus and Atlas. At the center of each dark spot is a small volcanic crater. Larger, less well-defined ash deposits are visible on the east side of Sinus Aestuum, northwest of the crater Sulpicius Gallus on the western edge of Mare Serenitatis, and at the Apollo 17 landing site on the eastern edge of Mare

*A mosaic of the 5 best pictures taken from 10:03 to 10:25. The camera was set to the same settings for all but the first image, which had the white balance set to zero. The only processing done to this composite image was the individual images were cropped and lined up to create it.*

See MOON, p. 2

MOON, cont'd. from p. 1

Serenitatis. Rays are the most conspicuous bright deposits on the Moon. They're obvious because they contain bits of bright highland rocks excavated on impact from beneath the newly formed crater. When the Moon is full, the great crater Tycho is one of the most noticeable lunar features. It's circled by a gray halo extending out from the rim about one crater radius. The rays of Tycho stream as much as 1,900 kilometers to the northeast. It's uncertain if the ray that crosses the center of Serenitatis is from Tycho. If so it's the longest ray on the Moon. Compare this with Copernicus's rays, which extend 1,200 km in all directions. Other bright ray systems are centered on the craters Proclus, Byrgius A, and Kepler. Less conspicuous rays extend from Aristarchus, Anaxagoras, and Langrenus — can you see all of them?***

## MISSING VCR TAPES

Mike Marron has lent many folks his video's of either his 6 hour talk on the origins of the universe, or his tapes of Murder at the Observatory and Aliens at the Observatory. If you have one of his tapes in your possession, he is asking that you watch it soon and return it to him. If you can't get it to him, Terri will hold it for him as she sees him often at all our Astronomy events. Please get those back to Mike very soon. Thanks so much.***

## HOW TO BE AN OFFICER/DIRECTOR OF PAS!

Have you wondered what was required of you, should you become an officer of PAS? Well, I'm going to take the time to review each position. Then, I'm going to start posting, in future issues of the newsletter, those folks running for a position. **If you are leaving your position, please send me a brief paragraph stating why you must depart from the position you currently have so I can include it in the newsletter.** I'm hoping to get quite a few folks running for the positions. This year's elections, in May 2005, will be a big change in who is running the club. And it would be very nice to see some new faces. What will happen if one or more of the current officer's drop their position to be able to sit back and enjoy the club without having to make all the decisions? Well, if you can help out at all, please do. Read the descriptions below and consider becoming an officer of PAS for the Sept 2005 – May 2006 PAS year. Officer positions run along side the time frame of non-year-around school, thus they start in September and go till May because that is when we have our meetings. That is different then your Dues, which run a normal January to December year. There are a lot of perks to being an officer (see previous article I wrote about that in the September 2004 issue of PAStimes) and we'd like to have some new faces helping out. So, enjoy this article and please, let me know if you would like to run for the positions below. What I have planned is to make a ballot page to include in the May issue of the newsletter (which is picked up by you at the April meeting) allowing everyone a month to make the decision for who they will vote. Then those who can't attend the meetings can still send that ballot back to me and get their votes in. **I want to include a photo (if possible) of the person running for a position, and possibly a brief description to go along with that photo as to either their ideas about improving PAS or a paragraph talking about themselves.** I came up with this idea when I saw a ballot that was sent to us having to do with elections of officers for one of the timeshares we own. I thought it would be a good idea this year, if we tried something different and possibly had some new blood come into the club as officers. So, hang with me over the next several months and let's see if we can make this work. **If you wish to run for officer, let me know ASAP so I can start creating that ballot.** Thank you in advance. The below information is borrowed from the PAS Constitution (in quotes when taken almost verbatim) and also created from knowledge of what the past officers have done during their term in office.

THE PRESIDENT – Currently Mark Stephenson

"The President of PAS is not unlike the captain of a starship. His main purpose is to guide us in that mission of promoting our common interest in astronomy. With his creative vision and energy he steers us through exciting, imaginative, and educational monthly programs on topics from astrophotography to UFO's, from MMT to the VLA." "The President shall preside at all meetings. The President has the responsibility for contacting and scheduling speakers for the meetings and planning and scheduling of special events." The special events part of this has been handled recently by Terri who sets up the star parties with schools and for the PAStimes Star Tours. All events must be communicated to the Editor so that the events can be incorporated into the newsletter for the membership to be able to attend. "The President shall assume responsibility for the duties of any vacated office." "This is a position of personal gratification and prestige. It is an opportunity to meet personally and dine with professional and amateur astronomers, astronauts, scientists, inventors, educators and other pioneers in astronomy. The president also works closely with the Vice President and Directors in the planning and preparation of monthly programs." "The candidate of President must possess imagination, a fascination with astronomy, the ability to coordinate and lead others and to tactfully delegate responsibility and see it too its execution." This is an awesome experience and a great title to have for future résumé's, etc. The President's age is not mentioned in the Constitution, so I would assume that anyone 18+ can become President of our club. Past Presidents have been students from Brophy.

VICE PRESIDENT – Currently Jerry Belcher

The Vice President, according to the constitution, does everything the President does in his/her absence. In PAS currently, Jerry took on the responsibility of setting up the Star Parties that are to be held at Lake Pleasant. We currently have 2 a month: The Deep Sky star party is closest to the New Moon and then the Shallow Sky star party is on either side of it where their may be a Moon in the way of viewing. In the description of the President, above, you will see that the President is responsible for organizing the events. "The Vice President shall assist the President in the performance of all duties, and assume full responsibility to those duties should the President be unable to do so." So, the responsibilities are the same for President and Vice President, and they help each other to make PAS run smoothly. The future Vice President does not have to do the Star Party part that Jerry currently has. We will let someone else do that.

SECRETARY/TREASURER – Currently Richard Guthrie

This is an interesting position. "The Secretary-Treasurer shall be charged with the responsibly of recording the minutes of each meeting, handling any necessary correspondence with other societies and organizations, collecting all Society dues, maintaining proper records of paid members, maintaining records of custody and disbursement of all Society funds,

See OFFICER, p. 3

**OFFICER, cont'd. from p. 2**

and payment of anything PAS needs to disperse fund for." Now, Terri has had the position of Secretary/Editor, as in… I don't actually record the minutes of the meeting, but I do a review of each meeting in the future newsletters. So, the Treasury has been mostly, in the past, a position to maintain incoming and outgoing funds for the club. It is also important to note that the Treasurer must communicate the current membership list to the Editor so that the current members receive their newsletters. "The Treasurer shall hold and file all documents required for the Society's continued legal status as a non-profit corporation." "As an association we can go nowhere without a sufficient fuel supply and navigational charts. The Secretary/Treasurer monitors our financial fuel intake and outflow, and as historian, records our previous voyages." As far as the Secretary portion of this position goes, it will be up to the future Editor as to if they will take on the responsibility of recording the minutes of the meeting or not. They may wish to let the Editor continue to do the reviews of the meetings.

EDITOR – Currently Terri Finch

"This is the all important communications officer. By the mere packing of the information, the Editor can make or break attendance at our regular meetings. The Editor is also the translator of the technical, transmitting by tabloid. The Editor has creative freedom to do more than just announce the subject, time and place of the monthly meetings. It is the responsibility of the Editor to prepare and distribute all printed materials that are a part of the Society's normal functions, including the monthly announcements to members, by-laws, and membership lists when called upon to do so." The Treasurer has currently maintained the by-laws but that can be changed if needed. "The candidate for Editor must possess imagination, creativity, and organizational skills as well as the flexibility to function under deadlines. Accurate grammar, spelling, and compositional proficiency distinguish the office of Editor." This list is a good example of what the Editor is doing currently. The extra stuff that I do for the club could be considered jobs of other officers. So, whoever takes over, as Editor this May will only be responsible for the distribution of the newsletter and other printed materials. You do not need to fill my shoes 100%. " The Editor shall prepare and distribute a newsletter to all members providing, at minimum, the schedule for upcoming meetings and a summary of the previous meeting. The format, medium and additional content of this notice is at the Editor's discretion. The Editor will maintain contact with other area astronomy clubs, facilitating the exchange of useful information." We currently have a Co-Editor, but that is because I was unable to continue as Editor if I had to create the newsletter all by myself. Rather than see PAS go without an Editor, I chose to ask for help and Matt Kohl became my Co-Editor. The future Editor of PAS will have the discretion to choose to have a Co-Editor, or not. It is not a requirement. But I sure appreciate Matt's help.

DIRECTORS

Current Director positions include:

Star Party Director – Currently Jerry Belcher

Multimedia Director – Currently Dan Heim

Homepage Director – Currently William Finch

Public Relations Director – Currently Mike Marron & Kevin Harcey

"The Directors shall attend the meetings from time to time as required." "The Directors form the fabric of continuity in the organization. The Directors are the dream weavers of the month-to-month programs. The Directorship is a port of entry for advancement into other levels of the Society's leadership. The Directors provide the major creative input into program direction. The Directors share direct responsibility with the President and Vice President for program planning." "These positions shall be created or eliminated, by amendment, as deemed necessary by the Officers to accomplish specific functions essential to the operation of the Society. Any Officer may nominate directors. Should the Directorship be vacated, the President shall act to either fill or eliminate that Directorship, or delegate its duties." Currently we have the above list of Directorships. The *Star Party Director* oversees the set up and follow-through of the star parties. Mostly Terri has taken on this position as a point of contact for the club. Should someone want to take the position, it is open for the taking. The *Multimedia Director* was appointed because we needed someone to be in charge of making sure our speakers had all the A/V equipment they needed. When Dan leaves this position, someone else may take it or it could be cancelled and the responsibility would fall in the President. Since the President is supposed to be setting up the speakers, he/she would then also be sure that the speakers had all their A/V needs covered. This position also falls under Facilities Director: "The Facilities Director shall ensure that the Society's meeting place is open and prepared for monthly meetings, provide audio-visual support of the guest speaker, manage the storage and distribution of Library materials and arrange secure storage of Society property." *The Homepage Director* position was created to be assured that we have current data on the www.pasaz.org website at all times. This position requires a 1 to 2 times a month update on the website. And this information should be discussed with the Star Party Director as well as the Editor, to be sure that what the Editor puts in the newsletter, matches the events listed on the webpage. "The Homepage Director is responsible for maintaining a website for the Society with the goal of increasing visibility and access. The content of the site shall be coordinated with both the Editor and President." We also created the *Public Relations Directorship*. The idea behind this position is that these Directors would go out to various locations and find ways to contact resorts and such for the purpose of the PAStimes Star Tours taking a telescope job. Telescopes can be a great asset to the club in that if we get paid to do a job, we raise money for the PAS Treasury. At one time there was a Library Director (which the current President now houses the PAS Library). "The Library Director shall hold the Society's collection of books and other materials, and make them available upon request to members of the Society. The Library Director shall maintain a current list of these materials, updated as necessary, and distributed to members at least once each year." Who ever takes over as President, does not need to house the PAS Library. We will find someone to take the current Library from Mark if he does not want to be Librarian. These positions can be created or deleted as necessary. If you want to help out with any of these positions, come to a Meeting of the Minds you can learn of the current goals of these positions and so we can vote you in as a Director so you can help improve the club.

HOST – Currently John Pulis & Ed Garbero

"The Host shall be present before the start of each meeting to greet guests, assign name tags, ensure the comfort of attendees, and generally facilitate a relaxed and social atmosphere." We recently have the current Hosts also signing people in. We haven't been using the name tags

but could start this
**See DIRECTOR, p. 4**

**DIRECTOR, cont'd. from p. 3**

process up again. I find it more important to be sure that everyone signs in and gets greeted by the Hosts so they feel welcome. This gets the Host to learn everyone's name and gives our club the personally greeted touch. The Host is also currently passing out the most current newsletter to those guests who have not received it via the Internet, and are new to our meetings.

OFFICERS AND DIRECTORS RESPONSIBILITIES

In case you wanted to know what is expected of you as an officer or director of PAS, here is a brief summary. "The term of an Officer/ Director is one year. There shall be no limit on the number of consecutive terms served." Gee, if there was a limit, I wouldn't be Editor for so long. Your attendance is requested at all General Meetings (those are generally the first Thursday of each month) as well as the Meeting of the Minds, which is our "Officer's Meeting" whereby anyone can attend who wants to share ideas. These are held on the Last Thursday of the month so that all ideas we discuss or things that have to be voted on can be done a week prior to the General Meetings and announced at those meetings if necessary. This is where all the PAS business is taken care of. We no longer have business stuff being discussed at the General Meetings. We want the General Meetings to flow smoothly from brief announcements of upcoming events, right into the speaker, and closure for the night. This is to accommodate those speakers who have to drive a long way home, as well as to accommodate those attendees who might have to get up very early in the morning. Our meetings have a format that will hopefully accommodate any students of Foothills Academy in also attending without feeling like they are kept up too late to make it to class the next day. The other places we would like to see any Officers/Directors is at any events we attend as a club. For instance: Public Star Parties, Special Meetings or Events the club might be hosting, or anything else where the more Officers and Directors we have, the better PAS looks to the public.

SMOOTH CLUB

In order to make any club run smoothly, we must have officers in positions that they are fitted for that position. When I became Editor 11 years ago (yes, this is my 11th year as Editor), I had no clue what to do or how to do it other than copying my predecessor. When I became Editor, Bob Kemmeries was the long-standing editor. He had to leave in a hurry, so it fell on Richard Searles for one year. Then I was nominated into the position I only took it because I had someone, my current fiancé, to help me with it. We actually enjoyed it after we got to know what we were doing and then we became more creative about it. But at first, it was a scary position to me. And back then I had more time to put into it. If I didn't have Matt's help currently, we would have a thin 2-page newsletter without all the neat articles and such because I just don't have the time anymore to put into the newsletter, like I used to. But I have enjoyed my position and would like to see someone else enjoy it next year.

I know that most of the positions that we currently have filled with wonderful people, will not be filled next year. Currently, I am aware that the President, Vice President, Editor, Treasurer and a few other positions, will be vacant if not filled this May. Thus, we need you to fill those positions**. If you are interested in running for a position, send me a brief paragraph either on your plans as the new Officer/Director, or a paragraph about yourself so that I can include it in the newsletter and in the ballot I am creating. Also include the year (if you know it) that you first joined PAS.** Let's make sure PAS does not fall apart with the changes in officer this year.***

## WHO WROTE THE VERY FIRST SCIENCE FICTION STORY?

*received from Ted Finch*

Yes, this does have to do with astronomy. In order to write a proper science fiction story, it has to include science in the story. Thus, if you go to the link below, you will discover the very first science fiction writer in history, that got published. http://www.depauw.edu/sfs/backissues/8/christianson8art.htm Take a guess before you go to the link.***

## ROUND-ROBIN STORY CONTEST

Do you enjoy writing stories? Would you like to win a prize for doing so? The Round-Robin Story Contest continues. Based on the introduction to the story (May 2004 issue) and the previous chapters write chapter 4 (leave it open-ended so we can add more chapters). It should be approximately 600-625 words in length. No need to bother with paragraphs. The deadline is the 15th of each month. The editors will then choose which one they feel helps move the story along the best and include it in the next newsletter (please don't make us write it ourselves). If you are the winner for that month, you MUST attend the next meeting in order to claim your prize. (Prize may be awarded the following month if your hard-luck story about why you couldn't attend the previous meeting is convincing enough).

## HOUSTON, WE HAVE A PROBLEM CHAPTER 3

*by Leah Sapir, based on an idea by Matt Kohl*

I read the words aloud from the screen of the biochemical sensor: "ENERGY BASED LIFE FORM." "Energy-based?!" exclaimed William. "Not carbon-based? Is that possible?" "Look, life on Earth is carbon-based because carbon is such a versatile atom," explained Dan. "It can form all kinds of complex molecules, such as rings or long, branched chains. Living things need that to build the molecules they use, for structure and energy and other life processes - proteins, carbohydrates, DNA, and so on. But that's in Earth's climate. Those molecules wouldn't stand a chance of sticking together in the heat and radiation close to the sun. They'd be blasted to smithereens - like the proverbial snowball in you-know-where... So, energy-based life forms? Maybe they found a way to skip the 'structure' step and go right to the 'energy' part..." "Does the sensor say anything about intelligence?" I asked Terri. She fiddled with the controls a bit and said, "I can't get a reading. Omigosh, look at that!" I glanced over her shoulder. The reading on the sensor was varying erratically, as if the sensor couldn't make up its mind; and then suddenly the screen flashed and went completely blank. "It's like, it burned itself out trying to figure..." Terri said. Dan glanced out the viewport and asked, "Weren't they all the same color a minute ago?" We all rushed to the viewport to see what he was talking about. Some of the blobs were still green, and some had returned to their previous shades of yellow or brown. But some had turned all sorts of unusual colors. And not only that - they were now splitting up and combining in all sorts of random ways. A large blue blob and a small red blob merged and turned golden-orange. A medium-sized

green blob split up into three smaller blobs of varying sizes, and their colors changed to pink, purple, and turquoise. There seemed to

**See HOUSTON, p. 5**

**HOUSTON, cont'd. from p. 4**

be no logic to either the splitting or merging or color changes. "Wow! It's like watching a lava lamp!" exclaimed William. "But in technicolor!" added Terri. And then Jerry said, "There's just one thing I can't figure out." "Which is?" I asked. "Well, I just finished doing a few calculations. How long did it take us to do those evasion maneuvers?" "About 10 minutes," said William. "I noticed the time on the clock panel when I started and stopped." "That's what I thought. And, Dan, you're sure about our position before and after?" "Yes, of course. We were a little inside Mercury's orbit when the blobs hit us. Then we swung around the sun, and ended up just outside Venus's orbit on the other side of the sun." "Okay. Here are my calculations," said Jerry. To get from there to here in ten minutes we'd need to be going close to the speed of light." "Hey! Not bad!" William said. "I knew I had accelerated, but I thought, a tenth of c, max!" "In fact our ship can't do much more than about a tenth of the speed of light," Jerry replied. "Then how did we..." I started to ask. But I never got a chance to finish my question, because the ship started to vibrate strangely from the outside. "Buckle up, everyone!" Jerry called out. "It looks like we're in for a wild ride!" (to be continued)***

## THANKS TO ROUND ROBIN WINNER

I wish to thank Leah for submitting Chapter 3 in our Round Robin story. And as you read it below, notice how exciting it is getting. Wouldn't you like to have your ideas included in next month's story? Send it in today. Read over Leah's addition and make your own, and get that to Matt or Terri right away. I thank Leah so much for creating the next chapter, and with such excitement. I am eager to see how this story turns out in the end. Submit the next chapter, today, written by YOU!***

## TERRI IS OFFICIALLY ANNOUNCING

Life is getting more and more busy. You will be hearing from me less often over the weeks, especially around weekends and holidays. Unless something is a "timely" matter, you won't be receiving that many Digests from me any more. Also, I will be cutting back on writing articles for the newsletter and a few other things I do (related to other people's jobs in the club) as I want to cut back on what I do now, so that later, when someone else takes over my position in the club, they aren't expected to do everything I currently do. Thus, if someone else wants some of my jobs, that would be awesome. The Editor is only responsible for creating a newsletter. I have found all our speakers for this year so far, and we know that isn't my job. I have also done other jobs that aren't mine. Thus, starting with today's announcement, I'd like to let everyone know that if you have a job to do for PAS, don't count on me to do it for you. My life must have other direction if I'm ever going to be happy. I love what I do for PAS, but it is getting to be too much and appears to be increasing every year I stay on as Editor. Thus, today is your official notice. Please don't expect me to do your work. This is a club. Club = many people. It appears to me that everyone thinks the club = Terri. We are changing that over the next few months. Thanks for helping me to make PAS a great club.
As a side note, PAS is not the only club begging for NEW Officers. Both SAC and EVAC are having a hard time getting people to fill in as Officers. This is something we should keep in mind. If our club goes down hill because we don't have enough people to fill the positions needed, especially the ones that are very needed like Prez, Editor, Treasurer. Those are the three main ones, and without those type of Officer's, a club could fall apart. So, EVAC and SAC are having the same situation as we are. Let's out do them and make sure we have the people needed to fill the positions. ***

## STAR TALES

*Received from Bette Wurst*

Although Autumn skies do not boast the bright stars and distinctive constellations that summer skies do, the Autumn affords two extra hours of evening darkness to stargaze. A good subject is the distinctive w-shape of Cassiopeia. Between Cassiopeia and Perseus lies a twin star cluster called the Double Cluster, whose stars are evident when using binoculars.***

## THE SOCIAL NEWSLETTER

Did that get your attention? Good. Let me explain. Matt suggested and I love the idea... since there is not PAS Meeting in January and since we have an awesome Social to attend, why not pick up your February newsletter at the Social. So, when you get there, find the table with the newsletters, membership cards and anything else I would like you to take at that time, and take your items with you. Remember, the Social is the time for all the PAS members to enjoy some chatting, eating, and a big screen TV as well as the White Dwarf Gift Exchange. We also have a challenging Dart game and we can really use a prize for the Dart game and a door prize for everyone who attends. If you wish to donate, that would be awesome! Bring it along, disguised... Don't let anyone figure out what you have brought with you as a present by its package. So, if you have a book, put it in a large box, make it heavy with rocks, and make it seem like something worth while so that no one knows what it is, and everyone wants to fight over it during the White Dwarf Gift Exchange. See you there!***

## NOV. 17 "JERRY'S KIDS" STAR PARTY AT CHILDRENS HOSPITAL REVIEW

*by Richard Guthrie*

When Ed and I arrived, Jerry, Don, Dan and Mike were already set up in the courtyard. The sky was partly cloudy, but we managed to view the moon reasonably well. For the most part, the only other visible objects in the sky were the summer triangle, Vega, Deneb and Altair. Our viewing time was quite short, as the patients were on the hospital routine. Some of the staff members stayed on until we packed up a few minutes before eight. I'm sure that the children his group especially enjoyed the viewing, considering the circumstances of their hospital stay. We gave out lots of handout packets to the children, and staff. This was a good event, and I would like to see it become a regular part of our club activities.***

## EMERGENCY STAR PARTY REVIEW

On November 1, Mark and Terri got an urgent call. "Can you do a star party for our Jewish holiday "Under the stars" tonight? Well, that was very short notice but we did it. We were scheduled to go down to the Science Center and do a star party there. So, I got on the phone and called my

favorite telescope group and asked them to be at the Science Center without me because I needed to do this other star party. The group from

**See EMERGENCY, p. 6**

**EMERGENCY, cont'd. from p. 5**

Temple Beth Israel wanted only one telescope. I figured I would do it. Well, it worked out that Richard went to the Science Center and they had kiosks set up in the way. So, he couldn't get in to do the star party and instead called me back and offered to help out where I was. I figured we'd just impress the group that was hiring me with more scopes. Eventually, I also had Don helping and so the three of us did a star party for a group of about 100 people celebrating their night "Under the Stars." The night wasn't the greatest for viewing but we had a great time. Below is a letter we got from them in response to that night's events.

Dear Friends, On behalf of Temple Beth Israel, I thank you for making our holiday celebration truly a holiday "under the stars." I speak for the whole congregation when I say that we appreciated your expertise, your enthusiasm, and the fact that you came out with no notice. We look forward to a future return performance. Thank you again. Terry Taubman***

## NEWTON IGNORED THE OBVIOUS

*by Neil Christianson*

Theorists ponder what causes molecular clouds to fragment and then for each fragment to draw together from the inside to out — exactly what astronomers report seeing. They know gravity plays a role, but as yet, lack a trigger-mechanism to get these events to unfold. Neil B. Christianson, a retired aerospace engineer in Peoria Arizona, believes that that trigger-mechanism resides in a vector ignored by Sir Isaac Newton? You are asks to be its judge. Among other things, Newton gave us equations for orbital mechanics. These equations rest on his assumption that an orb's total mass, despite its radial distribution, can be considered to sit at its very center. He proved his assumption by separating an orb into concentric spheres. His spheres had walls of zero thickness and shared a common axis. He then chose an individual sphere and sliced across its axis to produce stacked rings. Then, he rotated the masses of its rings around its axis to locate them on the arc of that sphere's circumference. Using an individual ring's mass he then calculated the gravitational force it produced on a gram mass sitting above the orb's axis. Since the force produced was the hypotenuse of a right angle triangle, he simply used trigonometric relationships to obtain the vertical vector produced by that ring. He repeated the process for all ring slices in that sphere, then repeated the process for all other spheres. Adding up all vertical vectors, he showed that that sum was exactly the same as would be achieved by considering all of the orb's mass to be located at its center. However, he ignored, and rightly so, the horizontal vectors, because they had no effect on a gram mass sitting outside of the orb. But is it right to ignore horizontal vectors if the gram mass sits inside the orb? Gravity is a strange force — it always pulls. Earth's gravity pulls the moon toward earth with the same amount of force that moon's gravity pulls the earth toward the moon. It is a bi-directional vector that can best be visualized as an invisible rubber cord pulling equally on the two objects in question. Since it is a bi-directional vector it can never be cancelled out by another vector. It is an elastic force; but, unlike rubber, it gets stronger the closer the objects are to each other. Now applying gravity's elastic nature to a gram mass, which is internal to Newton's orb and interacting with those gram masses that make up the walls of his separated spheres, suggests gravity's horizontal vectors pull the orb's masses together in a manner similar to the pull exerted by molecules in the skin of a rubber balloon. It seemed reasonable then that the strength of pull (packing effect) on a gram mass at any depth within an orb would be obtained by trigonometrically calculating those cumulative horizontal vectors. When Christianson calculated the packing effects on gram masses located at various depths in cross sectional models of a cold-cored earth, a hot-cored earth and (as an after thought) an earth of constant density an interesting relationship popped up. In an **earth of constant density**, at all depths, the **numerical value of vertical gravity** plus the **numerical value of horizontal gravity** equals twice the **numerical value of vertical gravity on the earth's surface**. So, when descending into an earth of constant density, the packing effect of horizontal gravity cannot be ignored, as Newton did, because it quickly becomes the dominant of the two vectors. Based on Newton's equation, **w = mg** (**w**eight, **m**ass, **g**ravity) in the very center of the earth, according to the force of vertical gravity, you would weigh nothing, but according to the force of horizontal gravity you would weigh twice your surface weight. Since Christianson's earth of constant density was trigonometrically analyzed, using right angle triangles, the law of similar triangles applies. Thus, the relationship given above applies to any orb of constant density, even that of a molecular cloud. Hence the question, **"Does horizontal gravity trigger the fragmentation of a cooling molecular cloud; and, in turn, cause the drawing together of a fragment?"** If it does; it changes everything.

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## VATICAN OBSERVATORY CALENDARS

*by Rich Jacobs, M.D.*

2005 Vatican Observatory calendars are now available for purchase. The funds from the sale of the calendar supports the observatory in Tucson. Fr. Coyne, the observatory director, has served as a guest speaker at several astronomy club meetings around the state in the past and is really worth hearing, also. The calendar has some astroimages in it and is very well done. The cost per calendar is $15, they're very nice, and it does go for a worthy cause. (Let Terri know if you are interested. - *MK*)***

## EARTH SPEEDS TO ATRACTOR

*received from Bette Wurst*
*by Clay Thompson, from the Arizona Republic*

***Question***: Since the Earth is spinning on its axis at a certain speed, and the Earth is spinning around the sun at a certain speed, and the universe is expanding at a certain speed, how fast are we traveling through space in any given time? A number of you want to know why at this time of year there is along stretch of days wherein the hour of sunrise doesn't change, but the time of sunset does. You don't want to know. We're going really fast. I'm getting a little dizzy just thinking about it. First of all, if you're going to talk about how fast we're going, you need some frame of reference. How fast compared to what? Actually, I wouldn't' have though about that all on my own, but I read it in a back issue of the Scientific American, my guide for almost all of this answer. For starters, we are rotating once every 234 hours, 56 minutes and 4 seconds, and given the Earth's circumference, that

## ADS IN PAStimes

This is the PAS advertising column & is a FREE service to all PAS members, guests, & VIP. Any Astronomy related items (books, scopes, binoculars, services, etc.) may be listed here that are being SOUGHT or SOLD. The item will only be advertised for ONE MONTH, but may be renewed each month (as needed) by contacting the Editor, by the newsletter deadline (the 1st of the month). It is requested that Non-PAS Members please make a small donation for placing your ad in both the PAStimes newsletter and to my list of 170+ astronomy-loving email contacts. Please make check payable to Phoenix Astronomical Society and send to the return address on this newsletter. We do your advertising in hopes of great returns.

means that at the equator we're going about 1,000 mph in respect to the core of the planet. We also are whirling around the sun at about 30 km per second, or 67,000-mph. This is plenty fast enough for me, but there's more. At the same time that we're rotating and whirling and so on, the whole solar system is moving around the

**See EARTH, p. 7**

**EARTH, cont'd. from p. 6**

center of the galaxy at about 490,000 mph. Or at least that's what it said in Scientific American, which is a dandy magazine, even if I don't understand about one-fifth of the stuff in it. OK, so now we're rotating and orbiting and spinning around the galaxy at stomach-wrenching speeds. Next, it seems that along with all the other galaxies hanging around ours, we are zipping along at about 621 miles per second toward a region of space about 150 million light-years away known as the Great Attractor. The Great Attractor has a mass 100 quadrillion times more than the sun and is 500 million light-years across. Really. That's what it said in Scientific American, and I don't now why they would make up something like that unless they were just trying to show off. What we're supposed to do when we get to the Great Attractor or where we go after that, I don't know. I guess we should wait and be surprised. ***

## EINSTEIN'S WARPED VIEW OF SPACE CONFIRMED

**Gravity measurements reflect the space-time dragging effect caused by spinning objects**

Earth's spin warps space around the planet, according to a new study that confirms a key prediction of Einstein's general theory of relativity. After 11 years of watching the movements of two Earth-orbiting satellites, researchers found each is dragged by about 6 feet (2 meters) every year because the very fabric of space is twisted by our whirling world. The results are much more precise than preliminary findings published by the same group in the late 1990s.

**Frame dragging**

The effect is called frame dragging. It is a modification to the simpler aspects of gravity set out by Newton. Working from Einstein's relativity theory, Austrian physicists Joseph Lense and Hans Thirring predicted frame dragging in 1918. (It is also known as the Lense-Thirring effect.) Here's how it works: Any object with mass warps the space-time around it, in much the same way as a heavy object deforms a stretched elastic sheet, explained study leader Ignazio Ciufolini of the Università di Lecce in Italy. If the object spins, another distortion is introduced, "in the same way as the elastic sheet would be twisted by a spinning heavy wheel on it."

If the space around Earth is being frame-dragged, then satellites ought to be caught up in the deformation, scientists reasoned. Imagine how a second object on the elastic sheet would be moved by the scrunching motion created as the sheet is deformed. Ciufolini's team analyzed millions of laser signals bounced off two satellites, called LAGEOS and LAGEOS 2. Both are highly reflective spheres not designed to do any work of their own. They look like 2-foot-diameter (60-centimeter) golf balls and contain no batteries or electronics. The researchers say their result is 99 percent of the predicted drag, with an error of up to 10 percent. The details are reported in the journal Nature. The analysis is "the first reasonably accurate measurement of frame-dragging," said physicist Neil Ashby of the University of Colorado in Boulder. "Precise measurement of these effects predicted by relativistic gravity theories is crucial, as they have important implications for our view of the cosmos," Ashby writes in an analysis of the study for the journal.

**Black hole applications**

Specifically, the new results can be applied to black hole theory. In fact, it is with black holes — typically much more massive than Earth — that some of the first signs of frame dragging were spotted.

## SCOTTSDALE STAR PARTY REVIEW

**October 30, 2004**

It was a cold night but we had a great turn out. Howard, from EVAC, asked via email if PAS could assist at a star party in Scottsdale. We answered with 4 scopes. We had a great time and we were fed and paid. Leah joined along with Bruce, William had a scope and I brought mine. Bruce had his new 10" scope there which was experiencing 1st light that night. His other scope is the 8" and that is the one William was working with. There were 9 scopes total. One from SAC, 4 from EVAC and then the 4 from PAS. The night sky was mushy but we put on a good show. We were there till the Moon rose, and then everyone saw the moon and packed up and left. Our purpose there was to let the neighborhood kids who were trick or treating, enjoy a view through the telescopes on their travels to find more candy. WE had a great time even though it was cold out. I wish to thank Howard for asking us to join in the fun and I wish to thank my PAS Volunteers.***

## BOOK REVIEW: MOONWATCH

*by Mike Mortimer, from Universetoday.com*

Firefly has just published a package, Moonwatch - A Complete Starter Pack for the Lunar Observer that shows they're already into the Christmas season. Three great aids for viewing Earth's moon are within this sharp looking, light cardboard enclosure. These are; a book, a moon map and a sheet of photographs. As written on the package's front, together these make a comprehensive, complete starter pack for lunar observing. The book inside is Peter Grego's Moon Observer Guide. To sum up, this book talks about types of viewing equipment, how to record observations and what are the neat things too look for. The book is quite comprehensive though for more detail, it's the map you'll need. The Moon map by John Murray gives an index of

over 500 prominent features on the Moon's visible side. Of course in addition to rilles, craters and mares, you will see bright red marks for our probes and landers. This poster would look sharp mounted on any wall. North is at the top so all the names read easily for people in the northern hemisphere. Maybe there is another version for

**See REVIEW, p. 8**

**REVIEW, cont'd. from p. 7**

viewers in the southern hemisphere otherwise they will need to turn the map around and learn to read upside down! The map comes folded at 13 by 23 cm and unfolds to about 100 by 70 cm. The last item, and itself a very nice touch, is a broad sheet with photographs of the Moon. There are 26 images on each side of the sheet which effectively makes for a photograph for each Earth night. An image is about 11 centimetres in diameter. One side has photographs of the view from Earth's northern hemisphere and the other from Earth's southern hemisphere though from a quick perusal there's not much difference between the two. With this package it's quite easy and fun to look at the Moon in the night sky. Compare the Moon to one of the photographs on the sheet then go to the book to identify the features then go to the Moon map to pick up on small features or special locations. It's simple to do and very informative. With Moonwatch - A Complete Starter Pack for the Lunar Observer, Firefly publishers have put together a great Christmas gift great or a good any-day addition to a club or group that wants to get into lunar watching.***

## BRIEF DESCRIPTION OF EVENTS WE ATTENDED

### Flagstaff Festival of Science 2004

**Interferometer at Anderson Mesa**

The Navy Prototype Optical Interferometer facility is designed to make high-precision measurements of the positions of stars, their sizes, and eventually surface features.

**High Altitude Life Forms Sky ride**

We were whisked up an ancient volcano on the Snowbowl's Scenic Skyride for a Forest Service presentation at the top. Learned about life forms in the rare alpine tundra along with Merriam's Life Zones theory developed on the San Francisco Peaks.

**National Weather Service Open House**

Saw the sensitive instruments meteorologists use to track and predict our ever-changing weather.

**Science in the Park**

Wheeler Park is the location where there were hands-on activities including information about arthropods, birds of prey, and small mammals.

**Rock Walk**

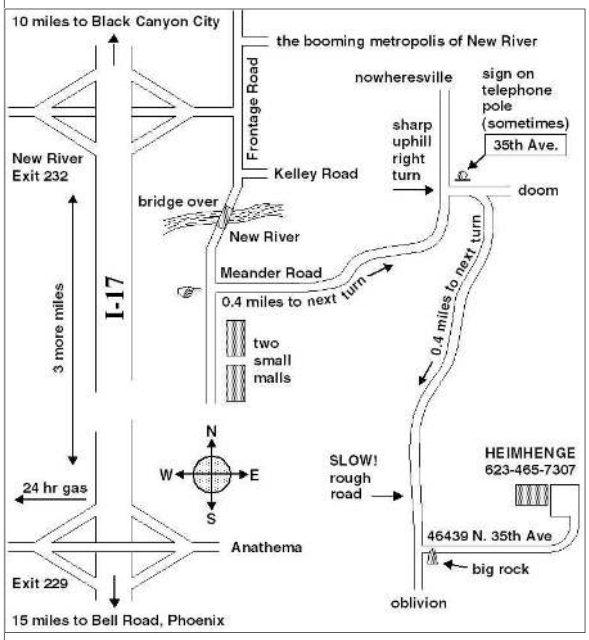
Started from Wheeler Park, featured Flagstaff's unique building stones that were home to fossilized marine creatures.

**Mountain Campus Science Day**

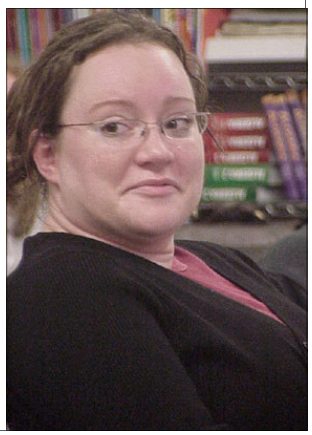
In the Wettaw Biology and Biochemistry Building at NAU, where bugs, life forms, electron viewing, a chemistry magic show and the mapping of the Mars Rover landing site took center stage.***

## HEIMHENGE PAS SOCIAL

Guess what time of year it is again. In January, PAS will be celebrating the Annual PAS Social. This is the time when you come with food to share, bring your family, and come to socialize at Heimhenge (Dan & Sandi Heim's home) and get to know everyone in PAS who you only normally see at the PAS meetings. This year we will be doing the White Dwarf Gift Exchange. Bring an astronomy related gift. Pick something you'd like to get if you were on the receiving end of the gift. Don't go too expensive - around $10 would be good. Wrap it up, disguise it, make it so no one knows what it is, but make it interesting enough that someone will want to fight for that gift. Everyone knows what a White Elephant is, right? That is where you have a gift, most of the time it is a gift no one wants, but in this case, choose a gift for the White Dwarf exchange that you would want to receive. Now, here is how we will play the game. Arrive at Heimhenge and swap your wrapped gift - one per person who wants to play the game - for a raffle ticket. This ticket is the order in which you get to steal other gifts from folks. Hold on to your ticket and when we start the game it will go like this: Person A will choose a gift from the table. Person B can then steal the gift from Person A or take one from the table. Person C will then steal a gift from A or B or get one from the table. If a gift is stolen, you can steal another gift but not the one that was just taken from you, or you can go get a new one from the table. Last year we had a surprise gift which Disa won. If you have an idea to spice up this game and want to put a gag gift into the pile, that is fine, as long as you make sure that you have a real gift as well so that everyone attending leaves with a gift. Remember, it is ONE GIFT PER PERSON in the game. Bring a gift for each person attending the Social in your group. Last year's White Dwarf was fantastic, so I want this year to top that. Also, remember to bring a food to share. Anything will be fine. The more food the better. Bring enough to feed about 30 people because we usually have a super turnout at the Social. And be sure to stick around for the famous Big Screen Movie presented by Dan. See you there!***




## THANK YOU DISA!



Disa Holly, a member of PAS, had the opportunity to do a demonstration for a bunch of school kids in which she asked me for info on PAS to supply to the kids. It was a great success and so she has asked for a second batch. The first batch was about 60 packets and she

was able to hand them all out. Each packet had info about PAS as well as our other handouts. I made the second batch of 35 and I know she will have a fun time with the kids as well as do a great presentation. Thank you so much for getting the word out to those school kids about PAS. Disa, you are wonderful!***

## THANK YOU LEAH

I wish to thank Leah Sapir, our duplication specialist (makes copies of the newsletter) for the wonderful T-shirts she brought back from the Solar Eclipse she attended. She ordered a T-shirt for her self and one for William and one for me. I wore it to the November PAS meeting. I love it. It is unique. She also gave one to Dennis Young while at that meeting. Thank you so much!***

## THANK YOU MARK

I wish to thank Mark for making the Officer's name tags. We received them at the November PAS Meeting and they look great. They will be very useful at future events. Remember, wear your name badges to everything astronomy so that they know who you represent - PAS. Thanks so much Mark, for getting those made for us.***

## YEAR IN SPACE CALENDAR

I have ordered the calendars. For those of you who ordered one and only get to see me at a PAS meeting, be prepared to pick them up at the December PAS meeting where I should have them in hand. Thank you for your orders. This year the orders didn't get us any major discounts, but the calendars will be enjoyed. Each calendar came to $9.95. Thank you again for your orders and be ready to receive them, soon.***

## ORIGIN OF THE STARS

*by Michael Smith of the Armagh Observatory*

I wish to announce the release of my book "The Origin of Stars". It is a readable text covering all aspects of star formation. I hope this book will appeal to astronomers and scientists wishing to expand their horizons, students seeking solid foundations, and general readers with enquiring minds. Where do stars come from and how do they form? These are profound questions which link the nature of our Universe to the roots of mankind. Yet, until a recent revolution in understanding, the proposed answers have been speculative. Now, accompanying penetrating observations, a new picture has come into prominence. This book presents the latest fascinating observations and scientific ideas covering star formation, star birth and their early development. It encompasses all aspects, from the dramatic stories of individual objects, to the collective influence of entire stellar systems. The very first stars to come into existence and the nurturing of planets are discussed to provide the

## JAMES BOND EXHIBIT AT THE ARIZONA SCIENCE CENTER

We didn't go into the exhibit itself but did some exterior looking around in the gift shop and at the two awesome Bond cars outside the exhibit. William, Matt, Kevin and I went exploring. Here we have the two cool cars. The exhibit costs to get in but it looks like it would be rather fun to visit. I believe this exhibit will be at the Science Center till March 2005. I have some info on it I will bring to the December PAS meeting that you may take with you. Anyone interested in going sometime in the near future?***

## INTERNATIONAL SPACE STATION AT ARIZONA SCIENCE CENTER

Now this is an awesome display to see. It is part of the general admission and a new addition to the Science Center. If you wanted to know how the astronauts live in space, how they brush their teeth, sleep, and spend their day, you have to see this display. Below are a few photos I took while there.***


*This is the sign that marks the beginning of the tour of the International Space Station display.*

*Off to the side, in another new display area, they have the Ecosphere. This huge glass ball has living creatures inside it, shrimp I believe. It is very impressive and on the same floor as the ISS display.*

*A plasma display with Matt's hand on it. I included this photo because I like the effect of the blue light sneaking out from under his hand. This is also in the same area as the Ecosphere.*


*I have William in front of the space shuttle. This is a display area where you can experience being in the shuttle.*

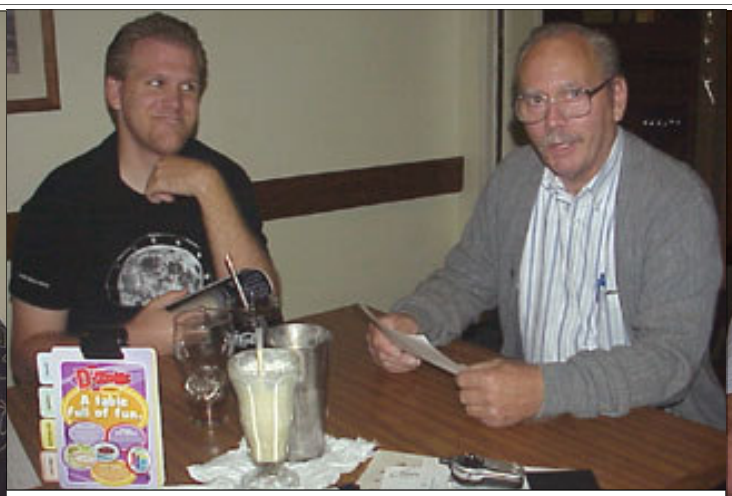
**MORE PHOTOS on p. 10**

*Here is an astronaut floating above you as you walk into the display. It is very impressive. Kids of all ages would love to see this.*


*Here is a second shuttle that is on display.*

## MEETING OF THE MINDS, OCT 28

*Mark Stephenson (Our President) was in attendance. He has a very nice shirt on in this photo. We have a great time when he comes to the meetings.*



*The Meeting of the Minds. This is the place where all the important decisions are made and discussed on how PAS will function. Here we have Matt Kohl (Co-Editor) and Richard Guthrie (Treasurer) sitting at the table at Denny's on I-17 and Dunlap, waiting for the beginning of the meeting.*

*Jerry Belcher. Hey, this is a good photo. Don't be surprised if you find it on the website soon. Jerry attended the meeting and supplied me with the dates for all of next year's star parties. Thank you Jerry!*

*Richard Guthrie. This is an awesome photo. I think it is the best I've taken so far and I believe I'll use it for the website. Richard is an awesome observing partner at the star parties.*

*We had Mike Marron also attending. Mike is one of two P.R. Directors. He always keeps the party going.*

*William Finch (Webpage Director) & Jerry Belcher (Vice Prez) were seen at this meeting as well.*

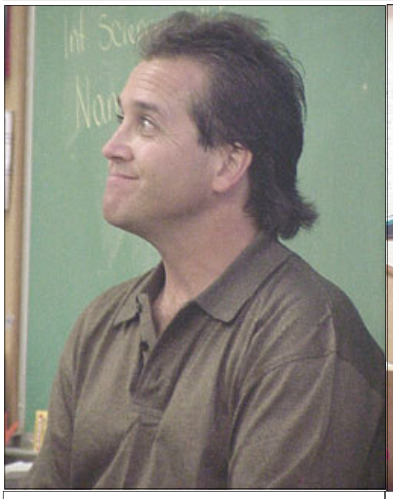
*Avery and Jerry Belcher were having a great discussion.*

*We had a very wonderful visitor come to our Meeting that night. Avery Crossman joined us. She seemed to enjoy herself and then afterwards, we also saw her at the PAS Meeting that following Thursday. We hope to see more of her. Thank you for attending Avery!*

## NOVEMBER PAS MEETING IN PHOTOS

We had an awesome turnout at the November PAS meeting. Below you will see some photos from that night as well as the review written right with the photos. And in this paragraph, you will find those items I didn't photograph. We got some really nice photos from this meeting. I wish to thank Gene Geisel for attending the meeting, too. The video that Dennis had brought along, that we had video difficulties on was about 20 minutes long and about Space Ship One. Also, Bruce won the 50/50 raffle which generated $14.50 for PAS. Dennis also shared an article from Sport Aviation Magazine which has an article on page 24 "Rutan Does it Again."

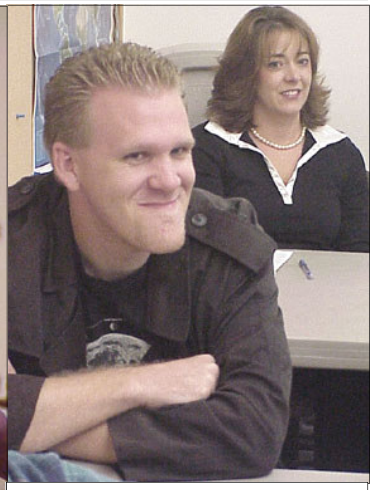
**More Photos on p. 12**



*Dennis Young was our awesome speaker for the November PAS meeting. He did an awesome, totally energetic talk for the group about his astro-scenic-photography. Afterwards we all went outside to view through his 28" telescope and he showed us some awesome items in the night sky. Thank you so much Dennis!*

*Here is Dennis showing us the details of his Crate Scope.*

*This is an awesome little scope. It is designed as a toy but Dennis was showing us how it has everything a serious young astronomer could want. It has a lighted star chart - in red, it has a working, real eyepiece, it has a 2" mirror which Dennis said you can see the rings of Saturn with. Dennis calls it his Crate Scope because it fits in a milk crate. It is a Cosmic Observing Station by Exploratoy, made in China.*



*We have Matt and Avery watching me as I take their photo. They are waiting for Dennis to get his stuff set up so we can enjoy his presentation.*

*Here we see Bette Wurst smiling. In the background we have Adam Bloomer and John Pulis.*

*We were even surprised to have Amanda Renner/Sallas join us. She came along to take photos for me and because she hadn't been there in a long time. I caught her here eating cookies.*

*Barbara Hartman is an awesome asset to PAS. She is the liaison between PAS and the High Desert Park in Black Canyon City. She is also our liaison for the International Dark Sky Association. And she is an awesome observing partner!*

*We had another surprise visitor. Carol Norton. She used to attend our meetings back when we were at Valley Academy and she has the cutest 2 dogs that travel with her.*

*Here we have our meeting room. Bruce noticed I was taking photos but everyone else was just chatting and waiting for the speaker to get organized.*

*Usually the editor/photographer doesn't end up in the pictures, but since Amanda was there and able to shoot some photos for me, I asked her to get one of me. I have on the white T-shirt that Leah gave to me.*

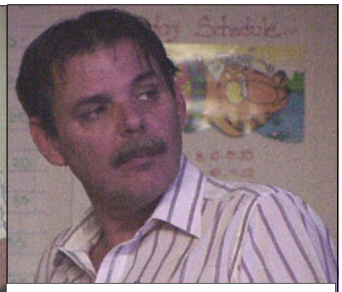
*Here is another nice room shot. We have, from back to front, and left to right: Roger is in the back scratching his head, then we have Don next to Barbara and then Leah looking like she is deep in thought about something. Then we have in green, Bruce and Disa and then Mike and Kevin. This was a great turnout. I appreciate everyone who attended the meeting.*

*Here we have a few more folks who attended our meeting that night. It is so nice to see new faces and to have such a large number of people in attendance. We had so many I believe Dan had to find 2 more chairs for the room That is a good thing.. to be lacking chairs. Everyone is welcome, all the time.*

## PICS FROM THE PAST YEAR

The pictures on this and the following pages are ones that have been hidden away in the editorial archives. So, if you notice yourself in one of the pics, you can reminisce about how young you looked (just kidding).

*Amanda and Richard await the A/V difficulties to clear up.*



*Dan was seen setting up the A/V equipment needed for Dennis's presentation. Here he is looking to see if the Video was working. We had video difficulties that night and didn't get to see the video Dennis wanted us to see. Dan does an awesome job with the A/V and Facilities for our meetings.*

## FESTIVAL OF SCIENCE

These pictures are from the annual Festival of Science in Flagstaff that the Finch and Wurst families enjoyed this past September.

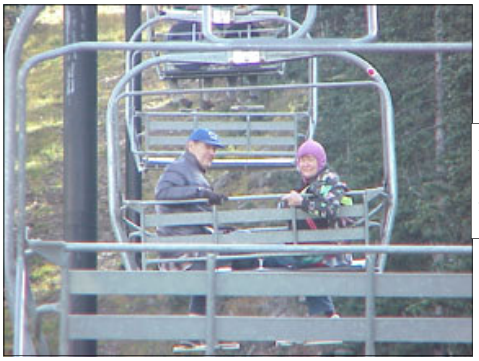
*On Sunday morning, a chilly cold morning without the extra altitude to add to it, we went up the Ski Lift at the Snow Bowl. This is part of the Festival of Science. Here we have Bette, Bruce, William and Ed all bundled up. They told us it would be40 degrees at the top of the lift. That was 40 degrees without the wind chill factor and the storm that was setting in.*

***1**) First you take 2 CD's and smash them together with glue, face to face, so their pretty backs (or bottoms) show outwardly. I picked my two CD's to be the same blue color.*

***2**) Then you take your CD's and attach a Styrofoam ball that has been sliced in half with half on the top and half on the bottom becoming the Planet attached to the rings. I was awaiting use of the glue at this moment.*

Everything has its beauty but not everyone sees it.

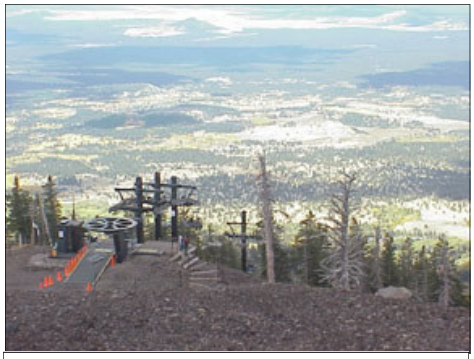
- Confucius



*Here is a close up of Ed and Bette riding the lift going up the mountain. It was not a warm day.*

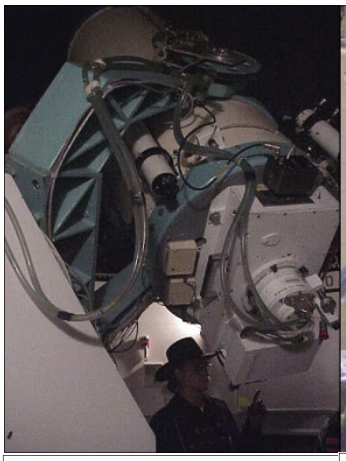
***3**)Then you look to see that it is centered. Mine was sliding all over the place. My guess is I put too much glue, but no one gave instructions on exactly how much to use and it was just a clear Elmer's type of glue.*

***4**)Then the gentleman who was standing up helping us took a paperclip and stuck it through the center of the Styrofoam ball, bent one side and attached a string. Then you add some glue to the top of the CD, and the Styrofoam if you wish, and drop glitter upon it, and tap off the excess. Then you pose for a picture of your completed Saturn with your Mom and Dad.*



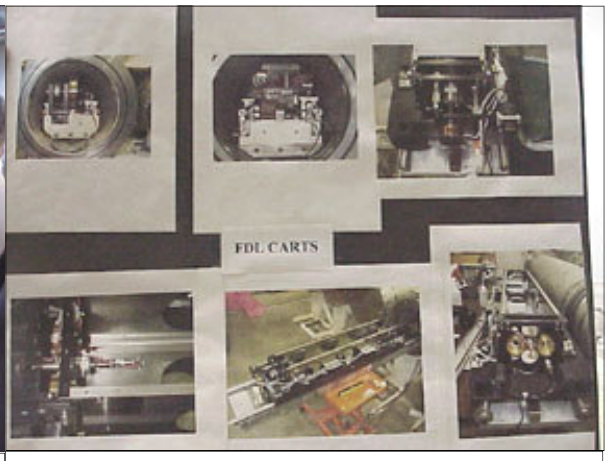
*From the top of the lift, and then up the hill where the tour guide was taking us, we can see the top of the lift, the trees, and way far off in the distance. It was a very nice view from up here.*

*The sign above William's head says "A Southwestern Willow Flycatcher." It looks rather dangerous to have one's head in that nest with that BIG bird watching you.*



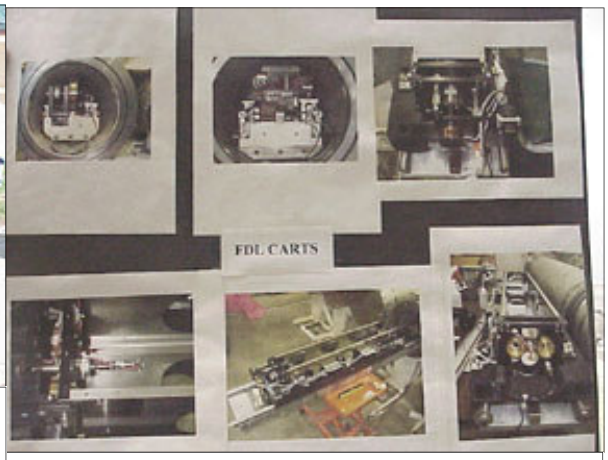
*Here we have the Telescope inside the dome of Braeside Observatory. This is really too close but I couldn't get a better shot from where I was. And it was dark in there. The silhouette in the background of a person is Dennis back there talking about the scope and dome, etc.*

*Here we have Ron facing us, talking to another visitor at the Naval Observatory. On the left, the yellow item is the housing for the CCD Camera.*




*Here is a chart showing the inside of the main building and how it collects the data and turns it into something that makes sense. (Interferometer tour)*

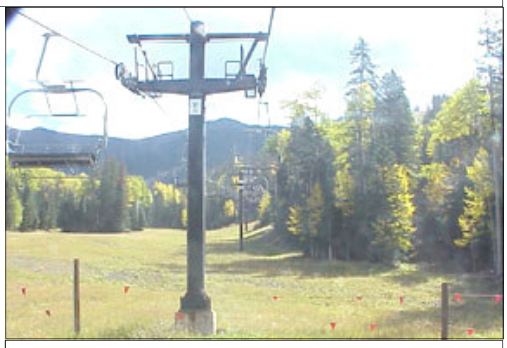
*It was a slightly overcast day. We had stopped by their huge satellite dish, pictures off to the left of this photo. William is on the left, then Bruce, then Bette and then Ed with the blue hat. Another gentleman was in our tour group. The shadow on the left is Clair telling us about the dish and how it works.*




*Here are some more photos of the tubes and where the data is transferred to within the main building. (Interferometer tour)*

*This is how they measure the snow depth. This stick stays positioned outside the Weather Service center and someone walks out to it and takes a measurement of how deep the snow has gotten using this stick. The stick is 5 feet tall. And this is Clair in the photo. Behind him on the left is a large tower in which they measure the wind speed and humidity and some other things.*


*As you ride up the ski lift, the signs on the poles tell you all sorts of things you might not think of. We made it to 10,000 feet and our destination was 11,500 feet. This is only pole 9. I didn't count all the poles (they are numbered) but at the top I'm sure the number was in the 30's.*



*Here we are, just taking off up the lift. Our destination is the top of that mountain directly in back of the pole. In front of us are Ed and Bette, and behind us is Bruce. They put us on the lift skipping one chair between each set of people. The sky was a bit cloudy. They predicted a chance for rain or snow sometime during the day.*

*Once the data is transported down those long silver tubes outdoors, you see that they come in and converge into these blue tubes which then focus the info into a single signal for the astronomers to be able to work with. (Interferometer tour)*

*Inside one of the square buildings, you find a mirrored items that catches the information from deep in space and collects it into silver tubes. We have Ed Wurst watching intently as a chart is shown to us on the wall nearby. (Interferometer tour)*

Hide not your talents, they for use were made. What's a sun-dial in the shade? - Benjamin Franklin

*Here we have the hood being removed as Nat White, our tour guide, shows us how this item works. (Interferometer tour)*

*The secondary mirror, located on top of this white base, catches the information and sends it down the tubes.*

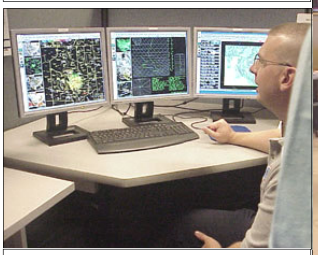
*The Interferometer is a huge area of land with three really long arms, with the telescopes in a moveable position such that one could have a very high resolution on a very small object. The mirrors work together to make this unit work very well. There are the transport tubes for the information. There are 6 tubes total.*

*At this location, they have one scientist who is very creative. He sends out email's with poetry. He makes interesting creative things at the Interferometer site - art work. This is one of his items in which it depicts a Double Star system. (Interferometer tour)*

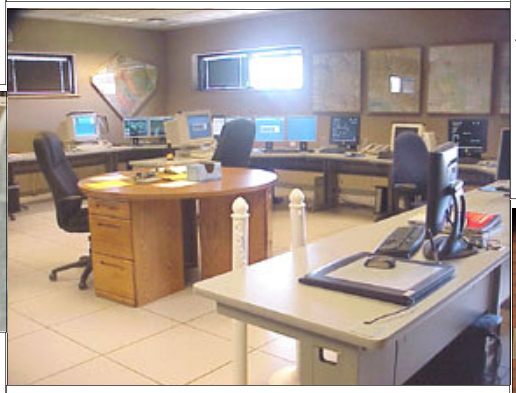
*Here is one of many domes seen out on the Anderson Mesa site where the Interferometer is located.*

*At the top, you want to get off the lift and walk quickly down the ramp before the chair runs you over. Bruce is doing just that. Bette didn't quite make it off the lift, so they had to stop the lift for a moment while she caught her balance. She actually ended up in the pile of cones on the left. There isn't much up at the top. We had an awesome tour guide, a forest ranger.*

*And then for our trip down, we saw many beautiful autumn trees that have changed colors. Bruce is in the car in front of us. You can see the lift station way off in the distance.*



*The National Weather Service was a very interesting place to visit. Our tour guide is showing us the different weather maps and explaining what they show and how they predict the weather. This is his station and he works with these three computers and the 2 on his right (out of photo).*



*It was a Saturday afternoon and most of the workers were in their individual stations. This is one larger, community station where they can discover the weather and research it..*

*Then we went outside for a tour with Clair (I may have misspelled his name) as our guide. He showed us these wonderful weather items, some were very old, and others were old but still being used today. He explained how each item worked.*

*And for our last photo of the National Weather Service, here we have their building. This was taken over our car, so the top of the car is reflecting the beautiful clouds. Most of them were beautiful but you can see that some of them looked like they threatened to rain on us. In this photo, the front of the building is the peak on the right. As you follow around the building out of site to the right, that is where Clair did his demos, and we were also at the back of the building, far side of building from this photo, and that is where the satellite dish was located.*

*When you come into the weather service, you are greeted by this wonderful gentleman who stamps our Festival of Science Passport. He also lets you take any of the handouts on this counter and then directs you into the first part of the tour.*

*Richard is setting up his telescope behind the Doctor which is on the right. The Cart in the center is brought out by the Astronomy department and had a TV monitor on it to show what the telescope next to it was on. This all happened last March at the ASU West Open House Star Party. These open houses happen every 6 months, one in March and one in October. We have an awesome time!*

**Astronomy compels the soul to look upwards and leads us from this world to another.**

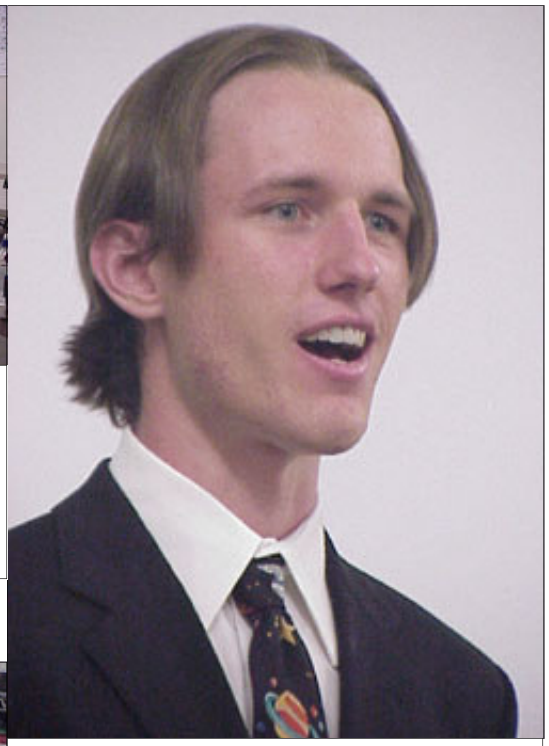
**- Plato**

*Here we show Don collecting things from his white car, the PAS Table with the Doctor set up near by, William collecting things from our car, and Don's scope set up on the far right. In the background are the (then) newly built dorms for the ASU West students. We can always use more scopes out there and we usually have an awesome turnout of the public.*


*October Meeting: Here is William posing for me as if he is speaking from the lectern. Notice the awesome image at the front of the lectern which shows us where we are and what we are doing. This lectern has built in speakers and a microphone, plus a lip on the slanted lid to hold a laptop, which is just what our speaker for October did. He placed his laptop there and it held it fine. Roger and Dan did an awesome job putting this lectern together for PAS. Thank you!*

*October Meeting:Here is our room at Foothills Academy. When we arrive, the tables usually need to be organized. If you arrive early, please move them into a logical format for viewing the speaker. On the left of this photo, the brown item up close, is the new PAS lectern which you will see in other photos. This is the wall to where the door to the room is located on the left side out of the picture.*

*October Meeting: Here we have Amber (aka Katie) visiting at this month's meeting. William is sitting with her and they are both watching over the XS Energy Drinks and snacks that are available to everyone. We have this table located at the back of the room in the farthest corner from the door.*



*October Meeting: Here is another image of our speaker. If I had his energy levels, I could accomplish more than I'm doing now. Wow, he did an awesome job. Thank you Ross.*

Only two things are infinite, the universe and human stupidity, and I'm not sure about the former.

- Albert Einstein

That's all the pics for this issue. Next issue the archives will be opened once again with Anthem and Astronomy Day pictures galore.

## STAR TALES

*received 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.***

NASA's Space Place

## A SUMMER VACATION TRACKING DOWN UFOs

*by Diane K. Fisher*

Erin Schumacher's summer job for NASA was to look for UFOs. Erin is a 16-year-old high school student from Redondo Beach, California, attending the California Academy of Mathematics and Science in Carson. She was one of ten students selected to work at NASA's Jet Propulsion Laboratory (JPL) in Pasadena as part of the Summer High School Apprenticeship Research Program, or SHARP. But is studying UFOs a useful kind of NASA research? Well, it is when they are "unidentified flashing objects" that appear in certain images of Earth from space. Erin worked with scientists on the Multi-angle Imaging SpectroRadiometer (MISR) project to track down these mysterious features. MISR is one of five instruments onboard the Earth-orbiting Terra satellite. MISR's nine separate cameras all point downward at different angles, each camera in turn taking a picture of the same piece of Earth as the satellite passes overhead. Viewing the same scene through the atmosphere at different angles gives far more information about the aerosols, pollution, and water vapor in the air than a single view would give. Ground features may also look slightly or dramatically different from one viewing angle to another. Erin's job was to carefully examine the pictures looking for any flashes of light that might be visible from just one of the nine angles. Such flashes are caused by sunlight bouncing off very reflective surfaces and can be seen if a camera is pointed at just the right angle to catch them. Because the satellite data contain precise locations for each pixel in the images, Erin could figure out exactly where a flashing object on the ground should be. Her job was then to figure out exactly what it was that made the flash-in particular, to see if she could distinguish man-made objects from natural ones. When Erin began working at JPL, scientists on the MISR project had already identified two large flashes out in the middle of the Mojave Desert in Southern California. These turned out to be from solar power generating stations. Soon, Erin began finding flashes all over the place. She learned how to apply her math knowledge to figuring out how the objects would have to be oriented in order to be seen by a particular MISR camera. One time, she and a team of MISR scientists and students went on a field trip to the exact locations of some flashes, where they found greenhouses, large warehouses with corrugated metal roofs, a glass-enclosed shopping mall, and a solar-paneled barn. For some flashes, they could find nothing at all. Those remain "UFOs" to this day! Learn more about SHARP at www.nasasharp.com and Earth science applications of MISR at www-misr.jpl.nasa.gov.

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

> The great thing about a computer notebook is that no matter how much you stuff into it, it doesn't get bigger or heavier.
>
> - Bill Gates

## ETs - *WRITE TO US*

*by Dan Falk, from Astronomy magazine (Dec. 04)*

If aliens from a distant solar system want to make their presence known to us, they'd do better to write than to phone - that is, to send something more like the Rosetta Stone than a pulse of radio waves, a new study suggests. The study, by Christopher Rose and Gregory White (Rutger's University), looked at the energy efficiency of long-distance communication. The results "suggest that our initial contact with extraterrestrial civilizations may be more likely to occur through physical artifacts - essentially messages in a bottle - than via electromagnetic radiation," the authors write. Their paper appears in the journal *Nature* (Sept. 2, 2004). The reason most discussion of interstellar communication has focused on electromagnetic signals, the authors explain, is that it was usually taken for granted messages would be short and that speed was of the essence - that is, that a prompt reply was desired. But if that's not the case - if you're sending a long and complex message, and you're not worried about the amount of time it might take to reach its destination - then a physical message is the most efficient choice, the authors say.***

## STAR TALES

*received from Bette Wurst*

The most distant known object in the Solar System is Sedna, first detected by astronomers last November. The planet-like object, thought to be up to three-fourths the size of Pluto, is 900 times the Earth's distance from the Sun. One orbit around our star takes Sedna about 10,500 years to complete.

The science objectives of the Cassini-Huygens mission include learning more about Saturn and rings, its magnetosphere, its largest moon Titan and its other icy moons.

All of he gas giant planets (Jupiter, Saturn, Uranus, Neptune) have rings, but Saturn's are by far the largest. Although only about one-half mile thick, they extend about three-fourths the distance from the Earth to the moon, or approximately 175,000 miles.

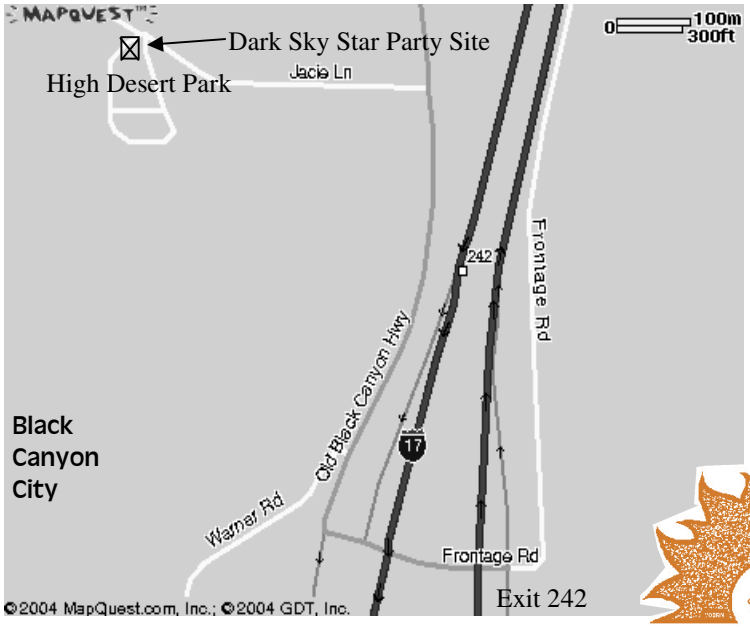
A permanent blanket of clouds covers Titan, Saturn's largest moon and the destination of the Huygens probe. It is hoped that Cassini's camera will expose great detail on Titan's surface – perhaps landscapes formed by hydrocarbon rain and rivers resembling a young Earth.

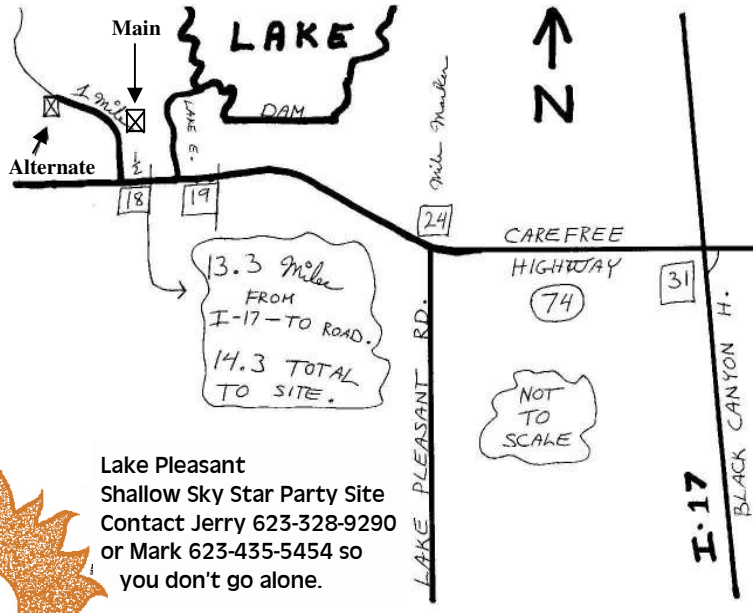
Later this year, on Dec. 24, the Huygens probe will separate from the Cassini orbiter and begin its 21-day journey into Titan, Saturn's largest and most mysterious moon. On January 14, 2005, it will descend through Titan's atmosphere and land on the surface.***

> I love deadlines. I like the whooshing sound they make as they fly by.
>
> - Douglas Adams

# UPCOMING EVENTS

| SUNDAY | MONDAY | TUESDAY | WEDNESDAY | THURSDAY | FRIDAY | SATURDAY |
|---|---|---|---|---|---|---|
| **DEC. 5** Venus 1.3° N of Mars | **6** | **7** Jupiter 0.3° S of Moon, occultation | **8** Hanukkah | **9** Mars 2° N of Moon; Venus 4° N of Moon | **10** Mercury in inferior conjunction - Mercury passes between the Sun and Earth | **11** ***Lake Pleasant Deep Sky Star Party,*** see map; New Moon 8:29 P.M. EST |
| **12** Moon at perigee; Geminid meteors | **13** Pluto in conjunction with Sun | **14** | **15** ***Deadline*** for submissions to February Newsletter; Neptune 5° N of Moon | **16** ***Meeting of the Minds*** 7pm Denny's I-17 & Dunlap; Uranus 4° N of Moon | **17** | **18** First Quarter Moon 11:40 A.M. EST |
| **19** | **20** Mercury stationary | **21** Winter solstice 7:42 A.M. EST | **22** | **23** Venus 6° N of Antares | **24** | **25** Christmas |
| **26** Full Moon 10:06 A.M. EST | **27** Moon at apogee | **28** Saturn 5° S of Moon; Mercury 1.2° N of Venus | **29** Mercury at greatest western elongation (22°) | **30** | **31** | **JAN. 1** New Year's Day; Earth at perihelion |
| **2** | **3** Jupiter 0.4° N of Moon, occultation; Quadrantid meteors; Last Quarter Moon 12:46 P.M. EST | **4** | **5** | **6** Saturn 7° S of Pollux | **7** Mars 3° N of Moon; Antares 1.3° S of Moon, occultation; Mars 5° N of Antares | **8** ***Deep Sky Star Party***, location TBA; Mercury 5° N of Moon |
| **9** | **10** New Moon 7:03 A.M. EST; Moon at perigee | **11** Neptune 5° N of Moon | **12** | **13** Uranus 4° N of Moon; Saturn at opposition; Mercury 0.3° S of Venus | **14** Asteroid Flora visible in Gemini at 8.4 mag. | **15** ***Lake Pleasant Shallow Sky Party***, see map |
| **16** Asteroid Herculina visible in Gemini at 8.9 mag. | **17** First Quarter Moon 1:57 A.M. EST | **18** | **19** | **20** | **21** | **22** ***PAS Social*** at Heimhenge, see map p. 8 |




Lake Pleasant
Shallow Sky Star Party Site
Contact Jerry 623-328-9290
or Mark 623-435-5454 so
you don't go alone.

PHOENIX ASTRONOMICAL SOCIETY
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PAStimes
Jan. 2005 Issue

# BRING A FRIEND

STAMP

TO:

MAILING LABEL

No January Meeting
Join Us at the Holiday Social Jan. 22

**THIS ISSUE:**

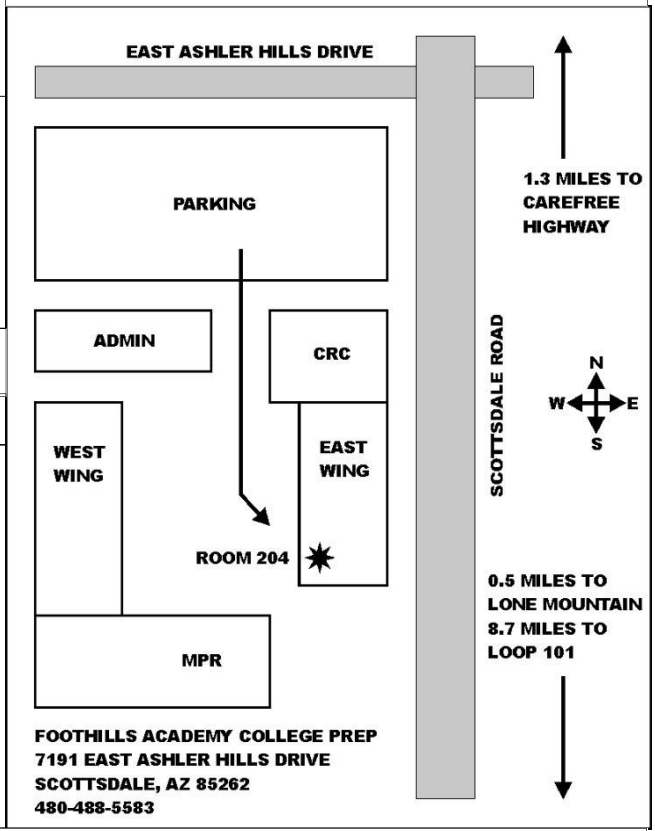


**PAS MEETINGS 2004/2005**
Feb. 3, 2005, 7 pm
Mar. 3, 2005, 7 pm
Apr. 7, 2005, 7 pm
May 5, 2005, 7 pm

MEETING OF THE MINDS 2004/2005
Dec. 16, 2004, 7 pm
Jan. 27, 2005, 7 pm
Feb. 24, 2005, 7 pm
Mar. 31, 2005, 7 pm
Apr. 28, 2005, 7 pm

## P.A.S. Meeting Location

Foothills Academy College Prep
7191 East Ashler Hills Dr, Rm. 204

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Submissions to **PAStimes** should be received no later than the 15th of the month for publication in the next issue. Email submissions received at: **PASEditor@yahoo.com** or **CoEditorMatt@yahoo.com**. Items arriving too late for an issue will be printed in a future issue (if applicable). PAStimes is produced monthly by Terri & William Finch and Matt Kohl. It is distributed to the members, friends & guests of the **Phoenix Astronomical Society**. It is also circulated to business, teachers, and organizations relating to astronomy. For needed changes to the **PAS Homepages** contact William or Terri Finch, or Matt Kohl. **KCH Cartoon** is by Kevin C. Harcey. Extra Editing & Newsletter Layout by Matt Kohl (MK). Meeting & Star Party **photos** taken & **Editorial** articles written by Terri Finch (Rip). Additional materials from sources as noted. For membership info contact Terri Finch or Richard Guthrie. For newsletter submissions or to get on the mailing list (2 months free) contact Terri Finch. PAS is a nonprofit organization with the purpose of educating the public, and sharing a great hobby! If you receive a duplicate copy of this Newsletter, please pass it on to a friend and inform the Editor. **CLEAR SKIES & HAPPY STARGAZING!!!**