



Of all things visible, the highest is  
the heaven of the fixed stars.  
Nicolaus Copernicus

Newsletter of the Pomona Valley Amateur Astronomers

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*nightwatch*

December 2007

This month  
we gave Ron an  
early seasonal gift by  
having someone else write the  
op ed for  
nightwatch

## **R**eflections November 2007

The good folks who put this newsletter together often ask if other members would contribute news and observations (so they won't have to write the whole thing themselves). After years of hearing these pleas I've finally decided to try making a contribution, and here it is. If it goes over well, I'll try to do this a little more regularly.

I'm calling this column "reflections". Besides the obvious pun on reflecting telescopes, I'd like to think of this as an opportunity to muse a little on what is happening in astronomy and it's relationship to the wider society.

One of the things that I think is important about astronomy is its ability to put things in perspective. There is a famous series of images from the Voyager II mission looking back on the solar system from just beyond the orbit of Neptune. Most of the planets can be seen as tiny dots. One of them, just barely visible near the Sun if you enhance the image as much as possible, is a small pinpoint called the Earth. I always show this picture to my college students and point out that everybody they know and everybody they ever heard of lives and has always lived on that little dot.

Another way to get perspective is to consider the Sun. We always like to think of the Sun as something big and important. So in the same lecture I like to show my students a picture of the M45, the Pleiades, and ask them which star in the cluster is most like the Sun. Most people pick one of the big bright stars that dominate the image. Then I point out a small 10<sup>th</sup> magnitude dot in one corner of the picture. It has the inspiring name TCY1803-868-1. That is the Sun as seen from a distance of 400 light years.

There is one more step I sometimes take which can even give a fairly jaded astronomer a moment's pause. I got this one from a group of astronomy teachers at University of Arizona.

## **W**hat's Up – A Lot Of Bully Secrets

At our last meeting my star chart centered on Taurus (The Bull) and its surrounding secrets. The newest secret is why the Comet Holmes (17P, 6-7 yr. cycle) became more luminous than at any other time in the 115 years since its first known appearance. It was discovered in 1892, not by Sherlock Holmes, but by English astronomer Edwin Holmes. Comet Holmes has a history of sudden outbursts. In this, its 17<sup>th</sup> periodic appearance, it has brightened to a 2.4 magnitude. One theory is that there are twin comets spiraling around each other and that they occasionally collide. The real secret of the comet would require a close-up look. This time around it became visible to the naked eye as it passed through Perseus, a ghostly round binocular object half the size of the moon with a tiny ion tail. Comets, traditionally feared as portents of human disaster, now seem merely spooky for their fuzzy aloofness.

A much older secret in Taurus is the first object to be cataloged in 1758 by Charles Messier – M1. Later it was nicknamed the Crab Nebula by the Earl of Rosse in 1840, who felt it had a crabby shape. The secret of its origin was revealed through the records of old Chinese and Arab astronomers. It was way back in 1054 A.D. when a 'guest star' suddenly brightened to a -7 magnitude. Such a flare-up, brighter than anything but the full moon, could only be a supernova. The Crab nebula is the remnant of a massive exploding star, that having exhausted its supply of nuclear energy, has collapsed in on itself to form a rotating pulsar. It has a distance of 6,300 light years and a width of 11 light years. Years of observation show its "clouds" to be expanding at a rate of 1,500 kilometers a second. Studies of radio, gamma, and X rays in the 1960s at first suggested the presence of a regular signal from an advanced alien civilization. But now the signals are known to come from a small rotating neutron star whose radiation emission is focused into a narrow beam like a powerful

In one of my classes I give students an exercise in which they look at a face-on view of the Milky Way galaxy. The Sun is marked, along with a series of letters at different locations on the galaxy. They are given the scale and told to figure out which ones might correspond to the locations of bright stars in the night sky. The distances to those stars are also given, so all they need to do estimate how many millimeters away from the Sun each star should be.

Usually after some false steps and few hints from me, they realize something amazing. Even a fairly distant naked-eye star like Deneb (over 1000 light years away) is still so close to the Sun that on a map of the galaxy it looks like it's almost in the same place. When we look up at the night sky, not only are we mostly seeing things within our galaxy, but we're also just looking at a tiny part of our galaxy.

*Now that's perspective.*

*Dave Kary*

lighthouse. Since the Crab Nebula is on the path of the Zodiac (Ecliptic Line), it has been used to study the atmosphere of Saturn's giant moon Titan as it passed in front of the pulsar's radiations, information that was useful in the recent successful landing on Titan.

Another old secretive object in Taurus is a star cluster celebrated in every mythology on the globe – The Pleiades, M45, or Seven Sisters. Shaped like the littlest dipper, it's filled with some 1,000 hot blue stars and brown dwarfs wrapped in a wispy reflection nebulosity. Charles Messier cataloged it as M45 in 1771, despite being an obvious naked eye object, perhaps to compete in number with his cataloging rival, Lacaille. Curiously, Messier didn't catalog nearby Hyades cluster in the 'bull's horns' of Taurus, even though they are mythologically half-sisters to the Pleiades. In Greek mythology the Pleiades are the seven daughters of the titan Atlas and the sea-nymph Pleione. M45 is the only star cluster which has traditional names for nine of its stars: Electra, Maia, Taygete, Alcyone, Celaeno, Sterope, Merope and the two parents Pleione and Atlas. The cluster appears in the verses of ancient Greek poets and even in the Bible: "Can you bind the beautiful Pleiades? Can you loose the cords of Orion?" (Job 38:31). It appears on a German bronze disk from 1600 B.C., the oldest representation of a star formation ever discovered.

The Japanese call the group 'Subaru,' which has currently become a car company using the star cluster as its logo. The large Japanese Subaru Telescope in Hawaii also honors this famous star cluster. It's not owned by the car company but by the Japanese National Astronomical Observatory.

Remarkably, many other cultures also see The Pleiades as representing seven sisters or young women. Often they are gathered together defensively, as in an Australian legend that tells of young girls trying to avoid being raped by the man in the Moon, or an American Indian story that tells of girls gathering together to fight off bear attacks. In the Ukraine, seven maidens dance together to honor the heavens. Many native tribes, such as the Aztecs and the Maori of New Zealand based their yearly calendars upon the "seven young women." The Vikings saw them as a hen with chicks, which sometimes magically turned into young women.

Aldebaran (the Bull's Eye), the brightest star in Taurus, was seen by a Mexican tribe as providing light for the seven young women of the Pleiades to give birth. First magnitude Aldebaran, Capella (She Goat) in Auriga, and Betelgeuse (Shoulder-Hand) in Orion are three giant yellow-red stars in the region around Taurus. Each is so large that if the sun were the size of a tennis ball they would be as big as tennis courts. Betelgeuse is one of the largest stars known. The three giant stars show evidence of orbiting companions that have yet to reveal their secret identities.

Of course we know all remote astronomical objects hide secrets as yet unrevealed, but none are quite as bully as those around Taurus the Bull.

*Lee Collins*

## Jane at JPL

Step outside this month, look up in the east, and you'll be in for a real treat! Mars is really bright and easy to view. That's the topic of this month's JPL What's Up video: Mars! It's as big and as bright as it will get this month, and it won't be this great a view again until 2016! What's Up: <http://education.jpl.nasa.gov/amateurastronomy/index.html>

I'm in San Francisco at the American Geophysical Union meeting this week. 15,000 + planetary scientists, students and AGU members and more are in attendance presenting, listening to or viewing over 14,000 talks and posters. A lot of the talks and posters are all about Mars!

Tonight, I stepped outside of my hotel, walked a few feet to Union Square, and looked East down Post Street and there was Mars. Mars is easy to see from the city, the backyard, everywhere. Have a look!

This weekend, the Old Town Sidewalk Astronomers will be showcasing Mars and the moon from Monrovia on Saturday December 15. We'll be out again Dec 21 in Pasadena and Monrovia December 22, weather permitting.

*Jane Houston Jones*

Senior Outreach Specialist, Cassini Program

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### PVAA Events Calendar

Month	Star Party	General	Board
January	5(MB)	18	10
February	9(AB)	22	14
March	8(MS)	21	13

### Site Legend

(AB) Anza-Borrego

(CS) Cottonwood Springs campground, Joshua Tree Natl. Pk

(MB) Mecca Beach Campground

(MS) Mesquite Springs campground, Death Valley National Pk

## General Meeting

Out of town visitor Curtis Hatterly located our Club on-line and joined us for the evening. Ludd shared the news from Sky and Telescope that they have been revamping their payment systems and to please be patient with any delays in processing our magazine subscription payments. The Victorville Star Party on December 4<sup>th</sup> has been changed to start one hour earlier, at 6:00 PM.

Due to a date conflict at Jouni's Restaurant we asked members to choose another date for our holiday party in December. We settled on Saturday, December 15<sup>th</sup> at 6:00 PM. Our apologies go to those unable to make the new date and to all for checking their schedules. We hope many are able to attend.

### November's Featured Speaker

Our speaker for the evening was Dr. Angelle Tanner, who works for JPL. She received her Ph.D. from UCLA in 2004 and her thesis topic was Extended Sources in the Central Parsec of the Galactic Center. Her current work for JPL involves selecting nearby stars where it is hoped Earth mass planets can be detected by the proposed SIM PlanetQuest mission.

The discovery of planets orbiting around other stars has become rather commonplace and it was interesting to be reminded that prior to the early 1990's, ours was the only solar system of which we were aware. There are now over 260 planets whose existence has been deduced, mostly from the behavior of their parent star.

The first and most common method of finding these planets is to observe their star's Doppler shift, or the shifting of the spectral lines toward the red when the star is moving away from us and towards the blue as it moves towards us. The small motions can be caused by the fact that the star and its planet are rotating around a common center of mass and the wobble of the star can be used to determine the approximate mass and distance to the planet. This method only works if the object pulls its star towards and away from Earth and has tended to find large, Jupiter-sized planets that are rotating closely to their stars and so are called hot Jupiters.

Astrometry is a second technique and is what SIM PlanetQuest will use. It will measure star movement against the background star field. Planets found this way will orbit in a plane perpendicular to our line of sight. It is hoped that the resolution planned for this mission will let us detect even smaller bodies, perhaps down to the size of the Earth. It should be able to see a motion the size of the width of a dime on the Moon as seen from the Earth.

The third way to locate extrasolar planets is to use a coronagraph that would block out the light of the star to see the planet directly. The SOHO mission uses a coronagraph to observe features of our sun and objects orbiting nearby by blocking out the direct light from the sun itself. NASA's Terrestrial Planet Finder plan would use this method of detection.

COROT, which stands for **CO**nvection **RO**tation and planetary **T**ransits, is a space mission led by the [French Space Agency](#) (CNES) and the [European Space Agency](#), among others. It was launched on December 27, 2006, and [cont. page 6](#)

## Kelso Dunes Star Party

Stutter bumps aren't so bad if you take them at speed. That's what I was thinking as my friend Don Clark and I sped down the dirt road towards the Kelso Dunes trailhead, rushing to get there so we could set up before dark. We left Upland at about 2:00 p.m. and after some slow traffic up the pass and a short stop for food in Barstow we pulled into the turnout at dusk. Of course Ron Hoekwater was already there to greet us as were fellow PVAA members Frank and Barbara Busutil, Bob Griffin, and Ken Crowder (with two friends). There were also a couple car loads of park visitors who had been out hiking the dunes.

We had our eyes on the sky the whole drive up, hoping for clear skies in light of conflicting weather reports that indicated various conditions from clear to cloudy. We weren't disappointed. Clear skies prevailed and the ever-present Kelso winds decided to take a hiatus. Transparency wasn't the best and the seeing was just so-so, but the sky was dark and clear so I wasn't about to complain. As the darkness settled in, the temperature dropped and we all shrugged on our jackets, eager for a good night of observing.

We had a nice mix of equipment, including 12" and 22" Dobsonians, a couple of 8" SCTs, and a pair of giant binoculars. After a short cool down, we picked our first target, comet 17P/Holmes, which was still low in the east in Perseus. Wow! The coma was roughly circular and so large that it seemed to fill the field of view in my widest eyepiece. I didn't take measurements, but I estimate it to have been between 30 to 45 arc-minutes across. (As big as or bigger than a full moon!) A slight brightening could be seen near the center and around the outer edge, giving the comet a 3-D, cone-shaped effect. A beautiful blue-green tint enhanced the view. It was fun to view the comet through different scopes and eyepieces as each offered a unique perspective.

The long nights of late autumn are great for observing because they offer a "three-season-view," covering everything from the summer highlights to winter's best and everything in between. After looking at the comet, we worked our way through some of our favorites in Hercules, Lyre, and Cygnus. Particularly impressive were the Veil, Crescent, North American, and Pelican nebulae. As the evening progressed we moved on through Capricorn, Pegasus, Cepheus, Andromeda, and Cassiopeia, observing a mix of clusters, galaxies, and planetary nebulae. Every now and then we would take another peek at the comet or head over to Ron's 22" for a look at some obscure gem that he had tracked down. Frank Busutil brought his Stellacam but had trouble getting it to come to focus in Bob's SCT (Frank didn't bring his scope). We look forward to some DEEP views next time he brings it out.

Finally giving up on the Stellacam, Frank and Barbara retired to the nearby campground at around 9:00pm. I didn't make it much later, hitting the sack by about 10:00 pm after a good four hours of observing. Ron, Bob, and Ken lasted a while longer, making it into the early morning hours.

Don and I planned to get up around 4:00 am for a look at some of the winter objects, but slept through the alarm and awoke to the morning twilight. I guess the winter objects will have to wait until, well, winter. Not wanting to [cont. page 6](#)

### PVAA Officers and Board

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### Desert Adventure Star Party for the Los Angeles Braille Institute

Our 5th annual *Desert Adventure Star Party* for the Los Angeles Braille Institute is set for **April 14th 2008**. We will be at **Cotton Wood Springs, Group area # 3, Joshua Tree National Park**. Tent camping is allowed or you may sleep in your vehicles. If you are bringing a camper, please let me know as only 2 are allowed. Park information can be reached at **760-367-5500**. The closest hotels are in Indio and Palm Springs, about an hour or less drive away.

#### Event Times:

- Set up - 12:00 Noon or when you arrive
- Desert Hike - 4:30 PM
- Dinner - Sunset
- Astronomy Talk - 7:30 PM
- Warm up Snacks - 8:00 PM
- Star viewing - 8:30 PM 10:00 PM

Please R.S.V.P. to by January 31 2008

[fbusutil.brightsky@pvaa.us](mailto:fbusutil.brightsky@pvaa.us)

909-524-5024 or 909-865-1095

#### Happy Skies To You!

(sung to the tune of *Happy Trails to You* by Roy Rogers)

*Frank Busutil*

Visit our website at <http://brightsky.pvaa.us/>



\*\*\*happy holidays\*\*\*





detected its first extrasolar planet, [COROT-Exo-1b](#), in May 2007.

This object is slightly larger than Jupiter. COROT uses the transit method which looks at the light curve of a nearby star, looking for the periodic dips which are evidence of the reduction of light when a planetary body passes in front of its star, from our point of view. It was planned to be sensitive enough to detect objects several times the size of Earth but has shown greater precision than expected and may actually be able to see evidence of the transit of an Earth sized body. NASA's Kepler Space Observatory would look for planets using this same method.

The smallest extrasolar planet located so far is about five Earth masses. As you can see from the large number of planets detected over just the last 10-15 years and from the list of launched or proposed missions, this is a very active area of study and research. It will be fascinating to see what the next decade or two brings! Thank you, Dr. Tanner, for an interesting talk and for bringing us up to date on this rapidly changing field of study.

*Claire Stover*

References: <http://www.astro.ucla.edu-tanner/>  
[http://en.wikipedia.org/wiki/Extrasolar\\_planet](http://en.wikipedia.org/wiki/Extrasolar_planet)  
<http://en.wikipedia.org/wiki/Coronagraph>  
<http://en.wikipedia.org/wiki/COROT>  
[http://en.wikipedia.org/wiki/Kepler\\_Space\\_Observatory](http://en.wikipedia.org/wiki/Kepler_Space_Observatory)

waste the early start, however, we put away the telescope and headed out to the dunes just before dawn. The dunes are a little farther, taller, and steeper than they appear from the trailhead, but we pushed pretty hard and managed to reach the top not long after 7:00 am. The low morning sun highlighted every ridge and ripple and Don took the opportunity to shoot several rolls of film. (Yes, he still shoots film!) It was fun (and fast) heading back down the dunes, jumping and sliding down the face. We didn't hear any of the "booming" sounds for which the dunes are famous, but the sand did conjure up some minor creaks as we made our way down. We both agreed that the dunes would also make a great moonlight hike for an adventurous family with kids.

Back at the trailhead, Ron encouraged us to take in some of the other sights in the Mojave National Reserve, including the Kelso Depot, Mitchell Caverns, and Hole-in-the-Wall. We didn't have time that day, but we look forward to taking in more of the sights on our next visit.

*Craig Mathews*



## Comet Holmes Taken on October 29, 2007.

Camera - Canon 400D.  
Telescope - Meade 10 inch SCT.  
Focal length - 2540 mm  
Exposure - approx 10 seconds.

*Ray Magdziarz*