



**Pay club dues at the General Meeting
or by mail. \$30 individual / \$40**

President's Address

Well, the election results are in and in a huge upset, I am re-elected your PVAA president. Also returning are Joe Hillberg (VP), Bob Akers (VP facilities), Ludd Trozpek (Treasurer), Claire Stover (Secretary), and board members at large Lee Collins and Ray Magdziarz.

Our star party at Astrocamp in Idyllwild was well attended. Clouds interfered somewhat with the observing but we had a great time! Many thanks to Larry and Ken and all the folks at Astrocamp whose hospitality made our stay so pleasant.

On September 13-14 the Pacific Astronomy and Telescope Show will be held in the Pasadena Convention Center. The show will feature several guest speakers and many vendors. Discounted tickets will be available at the general meeting. This is a chance for you to save money and support PVAA at the same time. For more info on the show:

<http://www.rtmcastronomyexpo.org/PATS.htm>.

Our next club star party is September 27th at the Mount Baldy Ranch RV Campground at Cow Canyon Saddle. Even with today's gas prices, this star party won't cost much to attend.

We have now held several star parties at this site. The most recent was the best attended star party we have had in several years. In the campground it is quiet and unlike at the turnout, there is no traffic after dark. For as close to town as it is this is a very good place to observe. The site is dark enough to see the Milky Way.

To get there take Mount Baldy Road into the village just past the school. Turn left on Glendora Ridge Road. After about a mile, at the top of the hill there is a turnout on the right. That is Cow Canyon Saddle. Drive through the gate down the dirt road. The campground is a few hundred yards on the right hand side. Be sure to check in at the Headquarters building. We will be on the hill at the south end of the campground.

I hope that many of you will join me at these events.

Ron Hoekwater

August General Meeting

Many of us have plans for retirement – finally having the time to fix things around the house, hopping in a motor home or on an airplane to travel the country or the world, devoting time to woodworking, or learning to play an instrument. Our August speaker, club member Frank Murray, retired from Northrup Grumman two years ago and began an unusual activity during all his new free time – the study of binary star systems. Frank has a Doctorate in Physicist and was an engineer by trade so I guess his selection of a retirement activity was not unusual.

We learned a lot from him about the math used to describe the interactions between multiple star systems. Binary and other multiple systems are surprisingly common, making up about one third of the objects we see in the sky. While the generic term double star is used to describe any two stars that appear close to one another, those described as binaries are gravitationally bound to one another. Optical double stars on the other hand only appear to be located close to one another from our point of view, they are not actually physically close to one another as are binaries. Since most of the multiple systems cannot be detected without major visual amplification or other wavelength analysis such as spectroscopy, they seem rarer to those of us into amateur astronomy where most of the night sky appears made up of single points of light. Pretty pairs of stars are displayed to the public as something unusual.

The study of such multiple star systems yields much useful information since measurements of their orbital characteristics can allow us to calculate their individual masses, important information which can only be found for binaries, the Sun, and gravitationally-lensed stars. If the stars are spectroscopic binaries, the blue and red shifts seen in their spectra can be used to determine their velocities toward and away from us. Generally, stars which can be separated visually are quite far away from one another, have orbital periods lasting tens to

Club Events Calendar

- September 12, General Meeting -
Jeff Schroeder - Adventures in Public Astronomy
- September 13-14, Pacific Astronomy & Telescope Show
(PATS) - Pasadena Convention Center
- September 27, Star Party - Cow Canyon Saddle, Mt Baldy
- October 4, StarGATE school event -
Call Craig Mathews for details 909.981.3131
- October 16, School Fundraiser,
Barnes & Noble, Chino Hills 7:30 – 9:30 pm
- October 9, Board Meeting - Village Grill 6:30 pm
- October 17, General Meeting
Steve Edberg - Space Interferometry Mission
- October 25, Sidewalk Solar Star Party @ Village Venture,
Claremont Metrolink Station 9am - 5pm
- November 1, Star Party - Mojave River Forks Regional Park
- November 5, Star Party - Ontario Library Main Branch 7–9pm
- November 6, Board Meeting - Village Grill 6:30 pm
- November 14, General Meeting
- November 22, Star Party - Cottonwood Springs
- December 4, Board Meeting
- December 12, Holiday Party - Jouni’s Café 7 pm
- December 27, Star Party - Claremont Hills Wilderness Park
- January 8, Board Meeting
- January 16, General Meeting
- January 24, Star Party - Mecca Beach Campground - Salton Sea
- February 3, Star Party - Ontario Library - Main Branch 7–9 pm
- February 5, Board Meeting
- February 13, General Meeting
- February 21, Star Party
- March 5, Board Meeting
- March 13, General Meeting
- March 21, Star Party
- May 22 - 25, RTMC

hundreds of years, and speeds too low to detect in their spectra. Those with different spectra orbit one another quickly and are located close together. The most useful objects are both visual and spectroscopic binaries but they must be located fairly close to the Earth to tell them apart in the eyepiece.

Those stars whose orbits around each other are in the same plane as our line of sight are called eclipsing binaries. They can be detected by observing their fluctuating light curve as the primary, or brighter, star is circled by its dimmer secondary companion. The shape of the curve can be used to estimate the relative size of the two objects as they eclipse one another. If they are different in size there is a total eclipse as the smaller goes behind the larger and an annular one as the smaller object passes in front.

There are also objects called astrometric binaries where a star, through its unusual motions, seems to orbit around an empty point in space. The companion object is assumed to be too dim to be seen in the brighter light of the primary object or perhaps it is a neutron star that does not emit very much electromagnetic radiation. Such systems must be within about 30 light years of Earth to be detected but then Kepler’s Laws of Motion can be used to study the star and its companion. The same principle was used to discover some of the largest extrasolar planets though the motions observed are of course much smaller.

Binary stars can also reach a point where one transfers some of its mass to the other. This occurs when some of the star’s material is in a region between the two where the other star’s gravity is stronger than its own. The matter is transferred through the first Lagrangian point of the system (L1). This point is one of five in a binary system where the gravitational forces of the two objects balance one another. A small object would remain stationary at any of these five points in a system. In this case, the matter moves from one star to the other via this L1 point.

Thank you for your interesting talk, Frank, and for sharing with us your appreciation of these objects which are so useful to study. Best of luck in your own further research.

Claire Stover

References:

- http://en.wikipedia.org/wiki/Binary_star
- http://en.wikipedia.org/wiki/Lagrange_points

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If It Quacks Like a Planet...

Deciding What Is and Isn't a Planet

This month we are going to start another “debate” over whether or not Pluto counts as a planet. I know a lot of folks feel very strongly about this (I’m sure this has been the most exciting topic the International Astronomical Union’s Nomenclature Committee has ever tackled), so I thought I’d weigh in with my own thoughts on how all of this came about. This month I will give the history of what counts as a planet up to the last few years.

PART I: A History of Who’s In and Who’s Out

A long long time ago (e.g. up until the 1600’s) most astronomers in European tradition would have said there were 7 planets: the Sun, the Moon, Mercury, Venus, Mars, Jupiter, and Saturn. They were all called “planets” (meaning wanderer) because they moved against the background stars. True, they didn’t all seem to be the same, but they all moved around in the same part of the sky, so the name seemed to make sense.

In the 1600’s, European astronomers (and later their counterparts in the colonies) started accepting the Copernican idea that the Earth went around the Sun. This led to a new definition of a planet as a body that goes around the Sun. With this reorganization of our thinking, suddenly there were six planets: we lost two (the Sun and the Moon) and gained one (the Earth).

After William Herschel added Uranus to the list in the 1781, all hell broke loose at the start of the 1801. That’s when folks started finding small planets (smaller than the Moon) between the orbits of Mars and Jupiter. First there was Ceres (1801), then Pallas (1802), and Juno (1804), and Vesta (1807). As the list grew into the tens then hundreds of bodies, it became clear that what we had between Mars and Jupiter was a swarm, not a planet, and so the entire group were renamed “Minor Planets” or “Asteroids”.

On the other hand, Neptune was also discovered in the outer solar system in 1846, and it was clearly a much bigger than Earth: obviously if you wanted to find anything big enough to really count as a planet, you needed to look out at the edges.

Neptune had been found in a new way: its gravity was affecting the orbit of Uranus, and mathematicians could calculate where this new planet was in the sky from what it was doing to Uranus. After Neptune was discovered, it seemed like something was pulling on it as well, so a hunt began for yet another new planet further out. In 1930, Clyde Tombaugh found it: Pluto.

Unfortunately, Pluto seemed a little bit small to be affecting Neptune. For the next 50 years, better and better measurements kept showing that Pluto really was tiny: not only smaller than any other planet, it was also smaller than some of the moons in our solar system (including our own moon). In fact, Pluto is much too small to have any noticeable effect on Neptune. It turned out that the whole idea of Neptune being perturbed was a mistake.

However, at the end of the 20th century, a more serious problem came up: it turned out that Pluto was not alone beyond Neptune. Instead, it seemed to be a part of another swarm of small bodies called the Kuiper Belt. For a while it was at least the biggest member of the swarm, but in 2005 even that changed when Eris was discovered and found to be slightly larger than Pluto. In addition, several other Kuiper Belt objects have been found that were close to the same size as Pluto.

Next month in the second part I will concentrate on discussing the definition of a planet.

Dave Kary

August Star Party at AstroCamp

Wow, did PVAA have an amazing star party in August! Thanks to Larry Kawano, administrator at AstroCamp in Idyllwild, cosmologist, and member of PVAA and to Allan Tiso, director of AstroCamp. We were invited to spend Friday night through Sunday morning, August 29-31 observing the dark skies of Idyllwild from their beautiful location. We were welcomed by Larry and were treated to a tour of the impressive facilities which includes lots of outdoor sports like simulated rock climbing, tight wire walking, Frisbee golf, swimming (used to teach campers about weightlessness in space), as well as a Mars yard, telescopes, laboratories, and all the amenities that one can imagine in a stimulating educational environment which specializes in astronomy and space exploration. Besides getting to appreciate the comprehensive facilities, we enjoyed excellent meals prepared by the ever pleasant AstroCamp staff. After observing each night, we enjoyed the comfortable dormitory, replete with showers and wifi.

The town of Idyllwild was hopping for the four day weekend. There were plenty of stores to browse through and lots of good restaurants. There were several musical groups playing around town and one singer was a friend of our PVAA member, Bill Vaskis. Idyllwild has many attractions. Some of us visited their historical society while others visited the nature center and the library which was having its annual book sale. All in all, it was the perfect weekend to visit Idyllwild.

Idyllwild is above 5,000ft in elevation. It is a large valley inhabited by 3500 people. The valley is ringed by peaks soaring up to 11,000ft. It usually has clear skies but surprisingly, we experienced very dramatic weather during our star party weekend. On Friday night we had some clouds but enjoyed viewing some ever popular astronomical objects like the Ring Nebula, Dumbbell Nebula, Cygnus Loop, and Swan Nebula. On Saturday afternoon we were surprised by a downpour that lasted a few hours. We all expected the clouds to continue throughout Saturday night and some of us called it quits on observing that evening...but too early! The sky cleared up by 10pm and we had great viewing until we turned in.

The biggest adventure though was the surprise landing of two rescue helicopters on the field where we had left our telescopes. Larry had suggested that we keep our scopes at the southern end of the field since the northern end was used by rescue helicopters. While most of us were jazzing around town on Saturday afternoon, two rock climbers fell off a popular rock overlooking the valley called "Suicide Rock". The climbers fell some 20 and 100 feet respectively. Rescue helicopters were able to lift the injured climbers off the rock and bring them down to AstroCamp's field. From there they were airlifted to hospitals. Unfortunately, Ron's 22" Dobsonian could only withstand the wind from one helicopter, the second chopper toppled Ron's telescope over backwards and onto the ground. By the time we returned from Idyllwild Village the scope had been covered and partially protected by some of our club members but access to it was curtailed until the rescue effort was completed. Happily, the telescope suffered no apparent injury. Larry and others helped Ron right the scope, remove, inspect and clean the mirror, and replace the mirror in its correct position. That night, after the clouds left us, the viewing was clear and we enjoyed sharing the night sky, especially with Hank, one of the former teachers at AstroCamp who kindly helped us pack up our equipment on Sunday morning.

PVAA members who got to enjoy this special weekend must give great thanks to Larry Kawano and to AstroCamp's director, cooks, teachers, and staff for their time and generosity. Some PVAA members inquired if we can help the camp with outreach in the future. To those who are not familiar with AstroCamp, I am sure you can find out more about their programs on the internet. It is an impressive operation and surely inspires young people as it did us.

Lastly, I must note: the internet says that the injured climbers survived their falls and are soon to be released from the hospital. We all have lots for which to be grateful and thanks again to Larry Kawano and AstroCamp for such a wonderful opportunity.

Laura Jaoui

Road Trip

Our next star party on September 27th will be at the R.V. Park at Mt. Baldy. The owners have been kind enough to let us use it again. This site is surprisingly dark so close to the city lights. The Milky Way is easily visible from this site. Once inside the R.V. Park, look for the P.V.A.A. signs to the site. Last time we had a star party there we had over twenty people show up. Hope to see more next time!

Jim Bridgewater

What's Up? – A Doctor & His Serpent At Our Galactic Center

The very center of our Milky Way Galaxy lies in the constellation of Ophiuchus (serpent bearer). Ophiuchus could be a representation of Asclepius, a doctor mentioned in Homer's *The Illiad*. If so, it might be the only constellation named after a real person. This all brings to mind seeing the Caduceus, a winged staff entwined with two serpents, on display in doctors' offices. But I found out that Asclepius' true staff was wingless with only one serpent entwined. The winged, two-serpent staff is the one held by Mercury, god of commerce and speedy profit. It seems the symbol used by doctors has more to do with medical profit than Asclepius' medical healing.

But let's get back to the constellation Ophiuchus wrestling with only one serpent. Wrestling with medical care or medical bills? What does a serpent have to do with healing anyway? One source says the serpent casts off his worn skin to be reborn, another suggests a cure-all, snake-oil serum.

What's clear is that Ophiuchus is so large it was subdivided into three constellations – the doctor, the serpent's tail (Serpens Cauda) and the serpent's head (Serpens Caput). Down at the doctor's feet, being shared with Sagittarius, lie the dappled Milky Way clouds of our galactic center.

Here also the ecliptic path of the sun, zodiac of legend, passes briefly through Ophiuchus. This brings up another controversy – is Ophiuchus the thirteenth zodiac sign? People are born under Ophiuchus. They could become doctors with snake-oil cures. This exclusion involves the shifting procession of the Earth's wobbling axis through the centuries. Astrology is operating archaically in the distant past when there were only twelve signs. But let's ignore the unrealistic faith of astrology and return to astronomy.

Just above the galactic center is the site of one of the first (1604 AD) observed supernovas. Pre-telescope astronomer Johannes Kepler initiated the word nova (new) to describe its sudden bright flare up. Within months it disappeared, causing Kepler to suspect an exploded star and to remark that maybe these novas had been happening unnoticed all the time. But no supernovas in our galaxy have appeared in the 404 years since then.

Below Ophiuchus lies the much brighter Scorpius (scorpion), the famous hook-shape with its two "stinger" stars also called the "cat's eyes." Scorpius was a notorious troublemaker, having battled with Orion so long that they were banished to opposite ends of the sky. At the Scorpius's heart is a red giant star, 1st magnitude Antares (rival of Mars). Next to this Mars look-alike is an easy-to-locate globular cluster, M4. It's one of a throng of bright, Messier-cataloged globular clusters that orbit our galactic center.

A huge globular cluster, M22, is right next door in Sagittarius (archer). Astrology sees Sagittarius as a centaur drawing a bow, but this asterism is more well known as "the teapot." Indeed the brightest part resembles a teapot with glowing star masses of our galactic center raising like steam toward Ophiuchus. There is also a shape called a "milk dipper" and a "teaspoon," but let's not let an archer's tea party get out of control.

The galactic center also has an enormous concentration of open star clusters, the brightest having been cataloged by the pioneer Messier. Here is M7, a cluster so bright that it was mentioned by the ancient pre-telescope astronomer Ptolemy. Here also are M6 (butterfly), M24 (star cloud), and M11 (wild duck). But the most photographed deep-sky objects here are the enormous emission cloud nebulas. In the "teapot steam" of Sagittarius lie M8 (lagoon nebula) with its star cluster, and M20 (trifid nebula) with its flower-like segmentation. Moving up, we pass near the faint constellation of Scutum (Sobieski's shield). A constellation named after a political hero's shield by a patriotic Polish chart maker in the 17th century. Here is the dual named M17 (omega/swan nebula), and M16 (eagle nebula) famous for its Hubble photograph of the "pillars of creation." The creation would be that of new stars, which are being born out of its huge illuminated clouds. Of course, if you turn this photo upside down, the pillars cease to exist.

Now in Sagittarius, dazzling Jupiter (-2.9th magnitude) with its four telescopic moons is hard to miss, but you might overlook faint Pluto (13th magnitude). Recently demoted to dwarf planet, it has yet to finish one orbit (249 Earth years) since its discovery in 1930. With its relatively large companion, Charon, it's our solar system's only double planetary system.

To the east of Sagittarius, along the zodiac, is Capricornus (goat) looking more like a sagging triangular bikini bottom than a fish-tailed sea goat. To the west of Scorpius is the only zodiac constellation named for an object, Libra (balance). It was fabricated in Greco-Roman times out of the claws of Scorpius and its two brightest stars still bear arabic names Zubeneschamali (northern claw) and Zubenelgenubi (southern claw). It was a balance because the Autumn equinox (September 22nd) of equal day and night happened at this solar location. Unfortunately, the procession of Earth's axis has since edged the Autumn equinox slightly over into Virgo.

A doctor wrestling with a serpent, a Mars-hearted scorpion, a birthplace of stars, an exploded star's ghost, or an archer's teapot. There are so many oddities around our galactic center, I've run out of room to write about them!

Lee Collins

Nightfall 2008 is Coming

I just wanted to make sure that you and the members of the Pomona Valley Amateur Astronomers knew about Nightfall 2008. It is taking place in Borrego Springs in late October and will feature three nights of dark skies at a wonderful desert resort. We are also hosting several astronomical imaging workshops, including two conducted by Craig Stark of PHD Guiding and Nebulosity fame.

For more event information, go to www.nightfall2008.com

Ralph Megna

For hotel or camping reservations call (800) 242-0044 or go online at www.pcoresort.com.

NIGHTFALL

DEEP SKY TREATS IN THE DESERT 2008

Thursday through Sunday
October 30 to November 2, 2008
Palm Canyon Resort
221 Palm Canyon Drive
Borrego Springs, California 92004
<http://www.nightfall2008.com>
info@nightfall2008.com

N I G H T F A L L B A S I C S

Nightfall 2008 is a four-day event held at a desert resort in Borrego Springs, California; this is the 16th annual edition. The resort supports the event by either switching off or changing to red all of the exterior lighting, and by making Nightfall the exclusive user of the property for its duration. There is no cost to come to Nightfall, but lodging or RV parking costs at the resort are the responsibility of the attendee (see below). You may also stay at a nearby hotel, or camp at the adjacent state park, and still set up on the main event grounds during Nightfall.



W H A T C A N I D O ?

You may attend Nightfall for one, two or three nights (minimum two-nights if you are staying at the Palm Canyon Resort). Many people make a mini-vacation out of it and come out on Thursday afternoon and stay until Sunday. Nightfall typically offers sunny, mid-fall days - great for exploring the nearby Anza Borrego Park; you can also attend workshops on astro-imaging and related topics during the day on Friday and Saturday (special registration/fees required). At night, there are several designated areas on the hotel grounds for telescope set-up; these areas have signs, and will be identified in the printed program. Large telescopes can be safely left outside, but participants are encouraged to keep cameras and other accessories in their cars, or take them back to their rooms, and you should provide protection against the sun and dust during the day. Other free activities during Nightfall include a Friday afternoon reception in the hotel saloon, a Saturday afternoon potluck dinner, and Saturday night sky tour.

H O W D O I R E G I S T E R ?



If you plan on staying at the Palm Canyon Resort, either in a hotel room or in the RV park, you need to call the resort at (800) 242-0044 or go online at www.pcoresort.com. **You should reserve early - the resort is often sold out by the end of summer.** When calling, please tell the clerk you are attending Nightfall (aka "the telescope event"), or you may be told the resort is booked for the weekend. Rates this year range from \$94 to \$105 a night for rooms, and \$28 to \$34 a night for RV sites; both require a minimum two-night stay. If you are coming in an RV and want to have a separate space for your telescope gear,

you must pay for that space. If you are interested in attending the astroimaging workshops on Friday or Saturday, please check the website - www.nightfall2008.com - for registration information and cost.