



Newsletter of the Pomona Valley Amateur Astronomers

I do not fear computers. I fear the lack of them.
Isaac Asimov

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nightwatch

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President's Address

The year 2009 promises to be a great one for Pomona Valley Amateur Astronomers. Over the next several months PVAA members will have the opportunity to participate in some really exciting and fun activities. Mark your calendars. You won't want to miss out.

Our February 13th general meeting will be one for the history books! PVAA is about to turn 40. Yes, February 2009 will be PVAA's 40th birthday. But, how did it all get started? How did this brainchild of a few Claremont High School students grow to be the club we know today? Our February speaker will be Tony Cook, a founding member of Pomona Valley Amateur Astronomers. Tony, who now works at Griffith Observatory, will speak to us on the birth and history of PVAA. Interestingly, several early PVAA members have gone on to careers in astronomy and science. This will have a rare opportunity to learn something about our club's early days.

On Saturday, March 21, 2009 RAS (Riverside Astronomical Society) and PVAA will hold a joint star party at GMARS. GMARS, the Goat Mountain Astronomical Research Station, is what RAS calls their Landers observing site. On the site there is a small house, restrooms, dark skies and plenty of space to observe them from. The RAS are a great group of folks and all PVAA members are encouraged to attend this very special star party.

Among of the most thrilling experiences of my PVAA life (or of my life in general for that matter) have been our group trips up to Mount Wilson to spend a night observing through 60-inch telescope. I have been afforded views of the planets Mars, Jupiter and Saturn that rivaled images from the Hubble space telescope. Revealing 17th magnitude stars with ease and intricate detail, invisible in a lesser instrument, planetary nebulae such as the Ring and the Cat's Eye are nothing short of spectacular. A night with what was once the largest telescope in the world is a unique and unforgettable adventure for any amateur

astronomer.

PVAA will have another observing run with the 60-inch telescope on Mount Wilson Saturday, June 20, 2009. Even though the city lights prevent it from being as dark as it once was, Mount Wilson is still renowned for the excellence of its seeing. We will be hoping for the marine layer to come in and knock down some of the light from Los Angeles.

Just being in the dome with the venerable old telescope, which saw first light in 1908 and was employed by the likes of W. S. Adams, Harlow Shapley, Milton Humason, George Ritchey, Walter Baade, and Allan Sandage is a thrill. To actually make observations with this instrument is a joy few amateurs will ever have the opportunity to experience.

We must pay a fee to the Mount Wilson Institute and unfortunately that fee has gone up significantly since last time we visited. The price will be \$100.00 per person, but I think that it is well worth it. The Mount Wilson Institute sets a limit of 25 people in the dome. Only the first 25 to pay the fee will be going with us. Until April 1st only PVAA members may reserve an observing slot. After that it will be open to anyone. If after paying the fee circumstances force you to withdraw, a refund will be given by PVAA.

In the summer 2009 we will be touring the Palomar Observatory. Palomar is the observatory which contains the fourth and final of the great telescopes built by George Ellery Hale, the 200-inch telescope on Palomar Mountain. We will not be outside, peering through a window at the great instrument, but up close and personal, inside on the floor with the 500 ton, 200-inch Hale Telescope. Only 30 people will be allowed to take the tour. As the observatory has started charging for the guided tour, there will be a \$5.00 per person fee. We will have a date and time soon. When we do it will be announced.

Let's make PVAA's 40th year the best one yet. Come join us at one or more of these activities. And, as always, happy stargazing!

Ron Hoekwater

What's Up - A Sword, 7 Sisters, & An Exploding Crab

Orion (the hunter) has a strikingly hourglass shaped human form that has impressed viewers as far back as Homer's *Odyssey*. This stellar giant was almost always seen as a hunter or a shepherd protecting his flocks. The three impressively aligned stars of Orion's Belt were sometimes seen as a diagram of how a hunter should closely trail his prey. Today's astronomers know these three stars, called the Three Kings by some cultures, also exist in a three dimensional reality that shows them to be not really in a close line up at all. But the illusion has inspired many references to Orion's Belt. In the movie *Men In Black* (1997) what might be astronomical is really a cat's collar.

Astronomically we wonder at the existence of a vast congregation of gas emission clouds stretching the length of Orion. Many of these nebulous gas clouds are huge, such as Barnard's Loop. This dim curved form probably originated from a supernova explosion over two million years ago. More visible to the eye are the brighter emission clouds such as the Great Orion Nebula (M42) in the Sword which "hangs" from Orion's Belt. Here swirling disks of gas tighten to incubate into dazzling new stars. An amateur telescope reveals a geometric new star system in M42's heart called the Trapezium. Moving up in Orion's Sword we find more nebulae – M43 and NGC 1977. Up near the bottom belt star are the Flame Nebula and the much photographed Horsehead Nebula with its chess piece form. A bit further north is nebula M78 which recently showed the constantly changing light patterns of these huge reflection nebulae. In 2004 astronomer Jay McNeil photographed a new outburst of star glow near M78. For a while it was called McNeil's Nebula, until it slowly faded away.

Orion also features two supergiant stars – red Betelgeuse (shoulder or armpit) and blue-white Rigel (foot). Both are over 50,000 times brighter than our sun, and their great surfaces would be beyond the orbit of Mars in our system. Betelgeuse, sometimes humorously called "beetle juice" as in the movie *Beetlejuice* (1988), is about as large as a star can get without starting to come apart. If our star were a basketball, Betelgeuse would be a football stadium. Betelgeuse is large, but older and cooler (3,000 F) than the tighter, hotter Rigel (50,000 F).

North of Orion is Taurus (bull), against whose horns Orion seems to be shielding himself. Here is the brightest and most famous of all open star clusters, The Pleiades, M45, or the Seven Sisters. Actually there are over 1,000 gleaming new stars in this cluster as well as reclusive brown dwarf stars. A brown dwarf is a small dim star in which the forces of heat and gravity reached equilibrium before the core temperature rose enough to begin a nuclear fusion, which would have made it brighter.

In mythology, The Pleiades are the seven daughters of the titan Atlas and the sea-nymph Pleione. It is the only star cluster which has mythical names for nine of its stars: Atlas, Pleione, Electra, Maia, Taygete, Alcyone, Celaeno, Sterope, and Merope. Both The Pleiades and Orion appear in the verses of ancient Greek poets as well as the Bible: "Can you bind the beautiful Pleiades? Can you loose the cords of Orion?" (Job 38:31). The Pleiades have been found carved into a German bronze disk from 1600 B.C., the oldest known star chart.

The Japanese call this cluster "Subaru," which is currently a car company using the group on its logo. The large Japanese Subaru Telescope in Hawaii is not owned by the car company but by the Japanese National Astronomical Observatory.

Cultures all over the world have been impressed by the tightly knit appearance of the Pleiades cluster. Many of these cultures see it as a group of young women gathering together in self protection. An Australian legend tells of young girls defensively grouped to avoid being raped by the man in the Moon. A Native American story tells of young maidens huddled to fight off a bear attack. In the Ukraine they dance in formation to proclaim their starry sisterhood.

Another open star cluster, The Hyades, form the base of the Bull's Horns. This more loosely knit group, although named after the half-sisters of The Pleiades, doesn't get as much attention. Here too is the Bull's Eye star, the red giant Aldebaran.

The most notable deep sky object in Taurus is the "exploding crab" – M1, the Crab Nebula. The first object catalogued by Charles Messier in 1758, it inspired him to begin his famous ground-breaking star catalog. It was the Earl of Rosse in 1840 who felt it had a crab-like shape. The Crab Nebula is striking because it's the expanding remnant of an exploded supernova star. A supernova, that having exhausted its supply of nuclear energy, has collapsed in upon itself to form a weird neutron star. A neutron star is supported by neutron pressure, not the fusion of a normal star. It has become extremely concentrated, only about 20 miles in diameter, but its gravitational density is immense. On Earth one teaspoon of it would weigh a billion tons. This neutron star rotates rapidly, sending out a lighthouse-like pulse at the rate of 30 times a second. It has become a spinning, pulsing star – a pulsar. Early radio telescope astronomers picking up this regularly transmitting pulse thought they might be receiving coded messages from an alien civilization. It was not aliens, but a bazaar pulsar.

The Crab Nebula is also the first astronomical object identified with a historical supernova explosion. It was way back in 1054 A.D. when a "guest star" was recorded in the records of Chinese and Arab astronomers. Also some American Indian petroglyphs, especially those at Chaco Canyon in New Mexico, appear to record this sudden starry explosion of light. It flared up to a -7 magnitude, almost as bright as the Moon. Many must have noticed it 954 years ago, but few left written records. The crab shaped nebula is its cloud expanding at a rate of 1,500 feet per second. It's 11 light years wide, and a comparison of new and old photographs show a decidedly moving difference in appearance. Of course, since it is 6,300 light years away, we are really looking at cataclysmic events that happened over 7,000 years ago.

So it is that many geometric starry forms and faint fuzzy nebulas, that ancients saw in terms of their own simple lives, turn out to be fantastically astounding objects of scientific study.

Lee Collins

Club Events Calendar

January 8, Board Meeting
 January 16, General Meeting - Bill Patton "Physiology of Vision"
 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 - Cottonwood Springs, Joshua Tree
 February 24, School Star Party -
 Hollyvale Elementary - Victorville

March 3 and 7, Claremont Class and Star Party with Laura Jaoui
 March 5, Board Meeting
 March 13, General Meeting
 March 21, Star Party - GMARS at Landers with RAS

April 1 and 4, Claremont Class and Star Party with Laura Jaoui
 April 2, Board Meeting
 April 2 - 5, 100 Hours of Astronomy public outreach.
 Details at www.100hoursofastronomy.org

April 10, General Meeting
 April 25, Star Party
 April 30, Board Meeting

May 1 and 2, Claremont Class and Star Party with Laura Jaoui
 May 8, General Meeting
 May 22 - 25, RTMC
 May 28, Board Meeting

June 5, General Meeting
 June 20, Mount Wilson Trip - Contact Ron Hoekwater

July 2, Board Meeting
 July 10, General Meeting
 July 18, Star Party

PVAA Officers and Board

Officers

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**Holiday Photos by
 Ron Hoekwater**





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**PVAA is going to
Mount Wilson
June 20, 2009**

Contact
Ron Hoekwater
to place your
reservation
909/391-1943

Get info about Mt. Wilson at <http://www.mtwilson.edu/60in.php>

