



Newsletter of the Pomona Valley Amateur Astronomers

Volume 32 Number 09

nightwatch

September 2012

President's Message

Last weekend I finally got around to visiting the Palomar Observatory and seeing the great 200-inch Hale telescope. I had read Ronald Florence's book *The Perfect Machine*, about all of the challenges and delays in the construction of the telescope, so I knew a lot of the history of the place already. But--as always in astronomy--there is no substitute for seeing something with your own eyes.

It was odd to stand in the dome of the 200-inch and think about how much astronomical history we have here in California. A visit to the 36-inch great refractor at the Lick Observatory fired my interest in astronomy and got me into stargazing in the first place. My first experience with the PVAA was going on one of the trips to Mount Wilson to observe with the 60-inch reflector, which Harlow Shapley used to determine the true extent of the Milky Way. The 100-inch Hooker telescope at Mount Wilson has been called by some astronomers the most important telescope of all time; it was the first scope to image individual stars in other galaxies, and it was the scope used by Hubble and Humason to document the recession of distant galaxies. And the 200-inch Hale telescope, the world's largest fully-functional telescope from 1948 to 1993, was used to refine the extragalactic distance scale and obtain the first images and spectra of quasars.

And it's not only the giant telescopes that have contributed to our understanding of and appreciation for astronomy. At least seven million people have looked through the 12-inch Zeiss refractor at the Griffith Observatory since 1935--who can calculate the impact that telescope has had, and continues to have? In a neat tying-together of these various threads, it was a look through the Mount Wilson 60-inch telescope that inspired Col. Griffith J. Griffith to fund the creation of a public

observatory in LA and to equip it with a large telescope specifically for public viewing. Said Griffith of the 60-inch, "If all mankind could look through that telescope, it would revolutionize the world." The connections run forward, too. Walter Baade happened to visit the Zeiss factory at Jena while the Griffith Observatory telescope was under construction, and he was the first to see starlight through it. Later Baade emigrated to the United States, and it was he who used the 100-inch Hooker telescope to resolve stars in the center of the Andromeda galaxy for the first time.

We are extremely fortunate to have so much astronomical history so close by, and so accessible to the public. I hope you are able to take advantage of it, and to see these wonderful machines for yourself.

Our speaker this month, Dr. Richard Olson of Harvey Mudd College, will take us much deeper into astronomical history with his talk on Babylonian astronomy and astral religion. I hope to see you there!

Matt Wedel

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



Photos by Gary Thompson



Photo by Dennis Lumbert

Club Events Calendar

- September 7 - General Meeting**
- September 15 - Star Party - Landers
- September 20-21 - PATS Astro Imaging Workshop
- September 22-23 - PATS
- September 27 - Board Meeting, 6:15**

- October 5 - General Meeting**
- October 13-Star Party–Salton Sea
- October 23 – Ontario Library Main Branch 7 – 9pm
- October 25 - Board Meeting, 6:15**

- November 2 - General Meeting**
- November 10 - Star Party - Anza-Borrego Desert State Park
- November 30 - Board Meeting, 6:15**

- December 7 – PVAA Holiday Party**
- December 14 – Evergreen Elementary School Star Party
- December 27 – Board Meeting, 6:15**

- January 12 - Star Party – Cottonwood Springs, Joshua Tree
- January 17 - Board Meeting, 6:15**
- January 25 - General Meeting**

- February 9 - Star Party – Mecca Beach, Salton Sea
- February 21 - Board Meeting, 6:15**
- March 1 - General Meeting**

- March 9 - Star Party
- March 14 - Board Meeting, 6:15**
- March 22 - General Meeting**

- April 6 - Star Party
- April 18 - Board Meeting, 6:15**

PVAA Officers and Board

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What's Up? - Dwarf Galaxies and Sea Gods

Dwarf galaxy sounds odd, because galaxies are supposed to be huge spirals of stars. Someone even started to call them hobbit galaxies to make them seem cute. But dim irregular dwarf galaxies are everywhere in the sky. Many seem to be out in the middle of nowhere but most are gravitationally attached to giant galaxies. Our Milky Way Galaxy has two brightly attached dwarf galaxies. They're the Large Magellanic Cloud and the Small Magellanic Cloud.

Both were named by explorer Ferdinand Magellan when he sailed southern seas in 1520 and recorded them as south polar markers. A Dwarf Galaxy dimly visible (9th mag) in California is Barnard's Dwarf Galaxy (NGC 6822). It was the first galaxy beyond the Magellanic Clouds to have its distance determined (700,000 ly) by Hubble before he went on to the Andromeda Galaxy. It's located between Sagittarius (Archer) and Capricorn (Sea Goat) in the southern area know as "The Sea" for its wet constellations.

But how do drifting dwarf galaxies form? One theory is that they're leftovers isolated by tidal forces produced when huge galaxies collide. Blazing globular clusters like Omega Centauri may be seen as dwarf galaxies. But most, although they can contain billions of stars, are dim objects like the Sculptor Dwarf Galaxy near the South Galactic Pole.

The Sculptor is a vague constellation of a sculptor sculpting or his sculptor cluttered studio. But it does contain the South Galactic Pole and near by the huge, shiny Silver Coin Galaxy (pictured). Discovered in 1783 by Caroline Herschel it's catalogued as NGC 253 (a galaxy that rhymes). Although it's 10 million light years away its high rate of radiant star formation gives it a hard-edged shape that can be seen by the unaided eye in dark skies. X-ray and gamma radiation suggest a big black hole at its core.



To the north is Piscis Austrinus (Southern Fish) where its close (25ly) alpha star Fomalhaut (fish's mouth) has been shown to have a gigantic planet that plows its way through the star's thick dust ring. The low mass planetary object called Fomalhaut b is the coolest object to be photographed outside our solar system.

North of Piscis Austrinus is watery constellation Aquarius (Water Carrier) with its Mercedes Benz logo shaped "water jug" that trickles stars. Here is the Helix Planetary Nebula (NGC 7293) which resembles a giant eye looking down at astronomers looking up. It's large and close but has a low surface reflectivity. Also in Aquarius is the Saturn Planetary Nebula (NGC 7009). Its complex ring system resembles Saturn and demonstrates why these shells of gas thrown off by collapsing red giants are called "planetary" when they really have nothing to do with planets. Also in Aquarius is bright globular cluster M2, the second object to be catalogued by Messier. By comparison globular cluster M72 is very loosely constructed, while M73 near by is one of Messier's mistakes. Not really a deep sky object but a group of three close stars that must have looked fuzzy in the cataloguer's antique telescope.

The dim planet Neptune (The Sea God) is now cruising through Aquarius toward Pisces (Fish). This outermost of the gas giants is rich in icy hydrogen, helium and methane. The methane gives it's 8th magnitude glow a blue appearance that inspired its sea god name. Based on oddities in the orbit of Uranus, Frenchman Urbain LeVerrier's mathematically predicted Neptune's position in 1846. Englishman John Couch Adams did his own calculations about the same time. This brought about an ongoing French / British rivalry about who first discovered Neptune. Four times the width of Earth, it's vast atmosphere has great dark spot storms. It has four thin rings and thirteen known moons.

Triton (Neptune's son) is its only large (1,680 diameter) moon. Its surface is covered with very cold (-391F) nitrogen. Triton is geologically active with cryogenic volcanoes and faulting. It was discovered (in 1846) by British amateur astronomer William Lassell, who brewed beer for a living. Triton is the only large moon to have a reverse (to the planet's revolution) orbit. This along with being tilted 40 degrees suggests a captured Pluto-type object. Neptune's other small moons, with oceanic names like Nereid and Proteus all seem to be captured rocky asteroids. Triton's frozen bumpy surface has given it a nickname "cantaloupe moon."

So although the dark region around the South Galactic Pole contains only a few bright stars it's rich in mysterious deep sky objects.

Lee Collins