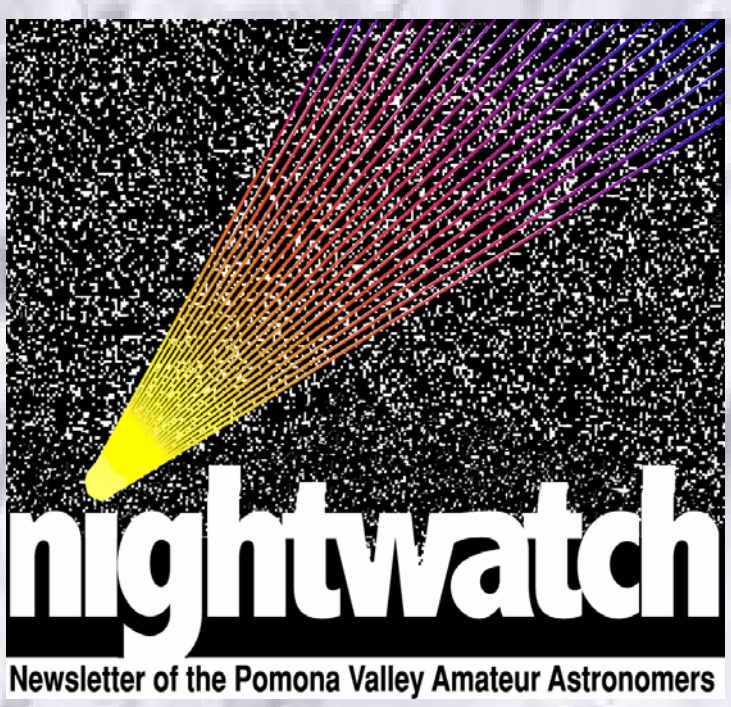


The missing issue

Volume 33 Number 07 ***nightwatch*** **July 2013**

President's Message

I know it must seem like these President's Messages are just Library Telescope update columns, but this will be the last one in that vein for a while. Our latest big push is over: on Wednesday, July 3, the original "Claremont Galactic Space Viewer" was joined by the second library scope, the "Tell-Me-Scope". Hopefully this will help whittle down that six-month waiting list to check out a scope.

It's been all quiet on the observing front for me for a while. Because of teaching, June through October are my busiest parts of the year. Last year I managed to fight that by getting up Mount Baldy on the weekends, but I haven't managed that yet this summer.

How about you—where have your summer observations taken you, either terrestrially or celestially? Do me a favor: whatever is exciting to you right now, take a few minutes to write me an email about it. Feel free to be conversational, not technical. But when you're done, instead of sending it to me, send it to nightwatch@pvaa.us, so the whole club can benefit from it.

Our speaker this month was Dr. Eric Grosfils, professor of geology at Pomona College, who talked to us about the possibility of ancient oceans on Mars at the July 19 meeting. For a more complete write-up, look farther on in this issue.

Matt Wedel

Club Events Calendar

July 6 - Star Party – Mt Baldy, Cow Canyon Saddle
July 11 - Board Meeting, 6:15
July 19 - General Meeting – Eric Grosfils - Oceans on Mars?
July 29 – JPL Tour 1pm

August 3 - Star Party -GMARS, Landers
August 3 – Girl Scout Star Party, Skyland Ranch
August 8 - Board meeting, 6:15
August 23 -General Meeting

September 7 -Star Party - GMARS, Landers
September 12 - Board Meeting, 6:15
September 13 – Project Bright Sky Star Party – Cottonwood Springs
September 20 - General Meeting – Matthew Ota on E.E. Barnard

October 5 - Star Party - Salton Sea
October 10 - Board Meeting, 6:15
October 18 - General meeting

November 2 - Star Party - Anza-Borrego St Park Parking Lot
November 7 - Board Meeting, 6:15
November 15 - General meeting

December 6 - Holiday Party - Sizzlin' Skillets, 7:00pm
No scheduled Star Party
December 12 - Board Meeting, 6:15

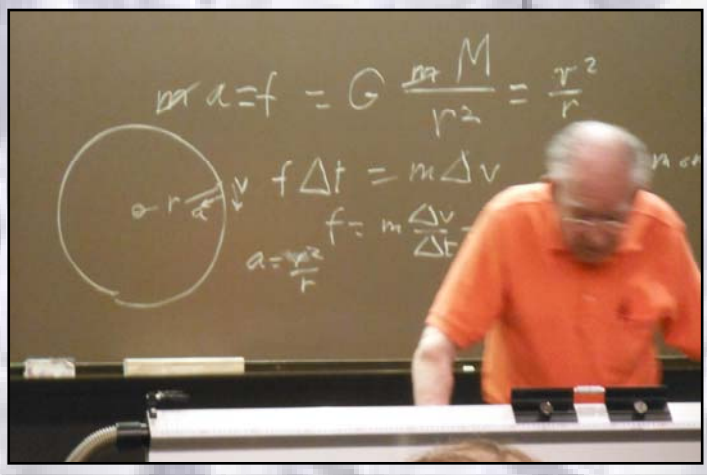
PVAA General Meeting 6/21/13

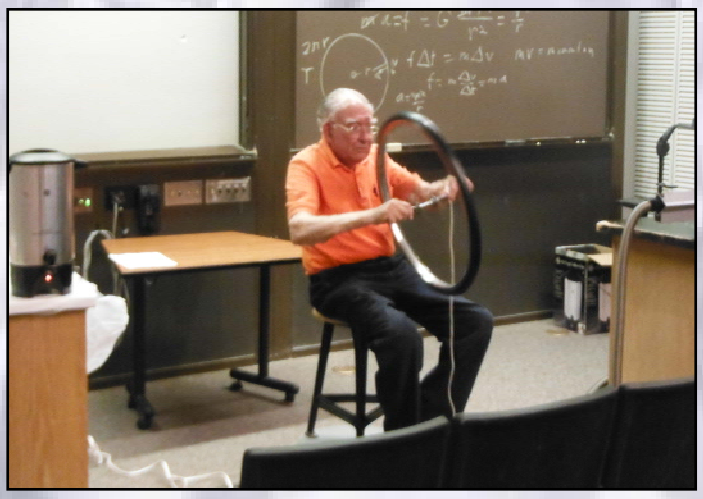
Fellow PVAA member Eldred Tubbs was the main speaker for the June's general meeting. The meeting was held at the Alexander room of Galileo Hall. The night's theme was “The Laws of Mechanics.” He talked and demonstrated the physics of changing a spacecraft's orientation. He also showed the principles behind velocity transference and combining masses of different velocities. He had some equipment set up to demonstrate. Eldred was able to use the equipment at Harvey Mudd College (HMC) because he was a member of the faculty from 1962 – 1978 before moving on to a position at JPL. His demonstrations were informative: How do you change the orientation of a spacecraft without using any fuel? - Like have the Cassini spacecraft point in a different direction to take a picture. - You use gyroscopes, or flywheels. (OK, NASA calls them reaction wheels.) There are several reaction wheels (but at least 2) to keep a spacecraft orientated. To change the orientation you only need to change the speed of one or more of the wheels. The spinning wheels make the spacecraft want to turn due to the change of the angular momentum of the reaction wheel. You then bring the reaction wheel(s) back up to speed and the angular momentum of the wheels cancel each other out, and the spacecraft quits turning. This was demonstrated by holding onto a bicycle tire while sitting on a rotating bar stool. When the tire was spinning in a vertical position the holder was motionless. Once he tilted the wheel, he began to turn as some of the angular momentum was being transferred to the bar stool.

Another demonstration used an air-hockey like table to simulate space's lack of friction. (OK, there still is friction, but a lot less than touching the surface.) He first had one object on a rail that bounced between the two ends. He then stopped the object at the halfway mark. He put an identical object on the rail and gave it a push. It then went until it hit the 1st object at the halfway point & stopped. The first object then traveled to the end, bounced off and came back & hit the second object which then continued back the way it came. This is the same principle as a “Newton Cradle” that you occasionally see on a desktop.

Still another demonstration showed the movement of a planet in a gravity well. This was a hands-on do-it-yourself/how-did-you-do demo. (You rolled a marble on a cloth that was severely depressed in the center.

Gary Thompson





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What's Up? - The King And The Ring

The King is Cepheus, husband of neighboring polar constellation Cassiopeia and father of Andromeda. While lacking first magnitude stars it contains the red-orange giant Garnet Star (Mu) as well as VV Cephei the largest star visible to the unaided eye. VV Cephei is 2000 times the size of our Sun. Here's the Fireworks Galaxy which has had more supernova than any other galaxy. Also in Cepheus are the spooky Cave Nebula and the original Cepheid variable, Delta Cephei.

Cepheid variables oscillate in brightness so that their cycle times are linked to their intrinsic luminosities. Know a Cepheid variable's cycle time in relation to its observed brightness and you can tell how far away it is. These "standard candle" stars were basic in Edwin Hubble's evidence that spirals like Andromeda (M31) were huge and outside our Milky Way. They had previously been seen as spiral nebulae inside our own galaxy.

It was in 1912 that star cataloger Henrietta Leavitt realized that Cepheid variables could be used to determine stellar distances. She wasn't recognized for this discovery in her time because of disadvantages: she suffered from deafness and was a woman. Hubble said she deserved a Nobel prize.

Leavitt was one of Professor Edward Charles Pickering's "harem" of women "computers" who did the laborious work of star photograph cataloging at Harvard Observatory. Pickering thought male assistant inadequate and declared his maid could do better work. So he hired his maid, Williamina Fleming in 1881. She went on to discover the Horsehead Nebula. Other women in the "harem" were Annie Jump Cannon and Antonia Maury who developed the Harvard alphabetical classification of star types. Despite classifying some 230,000 stars they were paid about .30 cents an hour. Was it the king and his ring? These "computer" women got more recognition as the 20th century progressed.

My Ring actually refers to the Ring Nebula (M57) in nearby Lyra (Harp). This best known of planetary nebulae was discovered by Messier in 1779 and described as "a fading planet."

Lyra also includes Epsilon Lyrae, a "double-double" where two stars divide into four. This reminds us that most stars are multiple systems.

Here is Vega, the first star to have a car named after it, although it meant vulture to the Arabs. It's the fifth brightest star in the sky and has always been an object of intense study. Only 28 light years away it was the first star to have its distance estimated by parallax. Over twice as massive as our sun it was the first star to be photographed and to have its spectrum recorded. It was the first to have its X-rays studied and to be found to have a dusty disk.

Vega is one of the Summer Triangle stars along with Altair (17 ly) in Aquila (Eagle) and Deneb (3,200 ly) in Cygnus (Swan). Cygnus, also known as the Northern Cross (a chicken to the Arabs) holds a multitude of astronomical objects. After the super giant Deneb (Tail) comes the celebrated color binary Alberio at the Swan's head. Here are the large clouds forming the North America Nebula (NGC 7000).

Cygnus contains powerful radio telescope objects. There's Cygnus A and Cygnus X-1. Cygnus A is two colliding galaxies giving off hard radiation. Cygnus X-1 is a powerful black hole which is stealing matter from a super giant star and radiating powerful X-rays. It's like a recurrent planetary nebula but it will eventually go nova. Its black hole is a safe 6,000 light years away while a closer double star is Piazzi's Flying Star. Only11 light years away its two dim red dwarf stars fly with a high degree of proper motion. They were spotted in 1804 by priest-astronomer Giuseppe Piazzi (discoverer of dwarf planet Ceres).

Here is the Blinking Planetary (NGC 6826) which blinks its optical trick in your peripheral vision. Dimly unique is the Crescent Nebula, the shell of a Wolf-Rayet star. Super hot Wolf-Rayet stars constantly eject burning gas into their surrounding space. Other faint nebulae are the Cocoon and the Egg. The Cocoon is a star nursery like Orion Nebula but much farther away. The Egg is a odd early stage planetary (pictured). New nebula are still discovered in Cygnus. We had a speaker, Dave Jurasevich, who found a faint bubble nebula no one else had noticed.

But the best nebula in Cygnus is that remnant of a supernova, the Veil Nebula. Some 6,000 years old it has come to form a delicate loop called the Cygnus Loop. The pieces of this loop many names and six NGC numbers

Cygnus, Lyra, and Cepheus have more deep space wonders that I have room to write about.

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Lee Collins