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Amateur astronomers just get better looking . . .

nightwatch

Newsletter of the Pomona Valley Amateur Astronomers

Volume 25 Number 9 ***nightwatch*** **September 2005**

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

President's Address

Summer is nearly over; autumn is almost here. In the upcoming months we have planned a public star party at Barnes & Noble Booksellers in Rancho Cucamonga. We have had several events in conjunction with Barnes & Noble and they have all been fun. The next one will be on the evening of Thursday, October 13th.

On October 29th we will have a joint star party with the Riverside Astronomical Society at their site near Landers. It will be interesting to see the many improvements, which have been made to site since the last time we were there. The Riverside group is a great bunch and this will be a lot of fun.

We will have our Mars observing session with the 60-inch telescope on Mount Wilson Friday, November 11th. If you have not previously observed through the 60-inch you won't want to miss this. Even if you have you still may not want to miss it.

I am working on getting us a tour of Goldstone sometime this fall. There is no definite date on that yet. When I have that information, it will be announced.

Once again we will be having our annual Holiday party on Friday, December 9th at Jouni's Cafe, 922 N. Central Avenue in Upland. There will be a drawing for door prizes.

And we will be having our regular monthly general meetings and star parties. I hope you all are able to enjoy some of these club activities.

Ron Hoekwater

August General Meeting

Two visitors joined our meeting, Chris Peterson and James, along with a long time member who doesn't get a chance to come to our meetings very often, William Fritz. We look forward to seeing them all again soon.

Lee Collins' What's Up for the month discussed the Summer Triangle and the many nebulae to be seen in this area which also contains views of our own Milky Way when the sky is dark enough. While two of the

Star Party Sites

(MBC) Mecca Beach Campground
(CS) Cottonwood Springs campground, Joshua Tree Natl. Pk
(CC) Cow Canyon Saddle, near Mount Baldy Village
(MS) Mesquite Springs campground, Death Valley National Pk
(CWP) Claremont Wilderness Park parking lot
(KD) Kelso Dunes
(WM) White Mountains (Grandview)
(CGT) Calico Ghost Towm Campground
(LNDRS) Riverside Astronomical Soc. Landers site
(BSMS) Blue Sky Mtn. Summit (Go to PVAA website)

PVAA Events Calendar

Month	Star Party	Star Party	General Meeting	Board Meeting
Sept	BSMS	3	16	8
Oct	CS	1	14	6
Nov	LNDRS	Oct 29	18	10
Dec	MS	3	9	1

stars in the bright triangle are close neighbors – Altair is 17 light years away and Vega is 25 – the third member of the feature shines at us from 1,500 light years distant. Deneb then has the greatest intrinsic brightness of the trio. The popular star party object Albireo and the small constellation Delphinus (also known Job's Coffin to the British) are found in this area of the sky as well. We heard about current space and NASA News from Dave Gardner including plans for further exploration of the Moon and Mars by the US and a Moon rock sample return trip by China. Thanks to Dave and Lee for their informative reviews.

The Club sold a few copies of Astronomy Magazine's "Explore the Universe 2006", which previews the sights for the coming year and has nice summaries of recent space exploration missions. The Club has more for sale at $6 each - see Claire or Ludd for your copy.

Club elections were held and the full slate was elected. We have one new Board Member – Sherry Martinez - who will be joining the rest of us in leading our club for the next two years. I was the winner of the raffle this month – and now have yet another handy object to add to the large bag of supplies I carry along to Club events – an astronomer's "Swiss Army style" knife with all sorts of wrenches and screwdrivers as well as a pen and a red light.

Ron announced the Club is planning another trip to the Mt Wilson 60-inch telescope on Friday, November 11th. The cost will be $60 for members and $75 for those not in the Club. The visit will coincide with good views of Mars in the evening sky and is a great chance for you to observe through this historic instrument. Please let Ron know soon if you are planning to attend, as a maximum of 25 are allowed in the dome.

Featured Film

This month, we enjoyed a change of pace and watched the recently released IMAX film "Space Station." We followed the ISS from the assembly of its first few components: the Zanya module in Russia, the robotic arm in Canada, the ESA's laboratory unit, and the United States' Unity module through their placement in orbit 250 miles above the Earth's surface starting in 1998. 16 nations in all have contributed to this international venture. The film contained lots of footage of the first two astronaut crews as they began joining together and powering up the pieces of the station then living and working in space aboard the ISS starting in 2000, letting us have a glimpse of what their weeks and months aboard the station were like.

I know I gained a greater appreciation of the huge volume of work involved in assembling this living and working place so far away from the support systems on our home planet. I also likened the enterprise to a gigantic camping trip or McGuyver adventure where you try to remember to pack everything needed for the trip and then make do with the objects at hand – including your trusty all-purpose knife! The international nature of the station was apparent both in the variety of countries that built modules and in the many native languages spoken by the astronaut teams responsible for their assembly as well as in the lack of political boundaries and conflicts visible through the ISS portholes to the Earth below.

Claire Stover

Mars Mount Wilson Trip

PVAA has reserved the 60-inch telescope on Mount Wilson for the night of Friday, November 11, 2005. For some this will be a holiday, Veteran's Day. November 11th is 12 days past Mars's closest approach to Earth and 4 days past opposition. It is 4 days before the full moon.

For PVAA members the cost of a night

PVAA 24 HR. Hotline.
Get the latest news on the star party, club meetings, special events and astronomy happenings.call **909/596-7274**

Visit our website at ***www.pvaa.us***

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observing with the 60-inch telescope is $60.00. For non-members it $75.00. No one can make any guarantees as to the weather on either Earth or Mars. Mount Wilson is known for its great seeing, but it varies from night to night. Mars sometimes suffers dust storms that completely blot out any surface detail. There will be no refunds. If clouds or wind prevent observing we will be assigned another night with the telescope.

Those who wish to attend should signup at the September 16th meeting or e-mail: <astro.ron@juno.com>. Don't be left out. Signup soon as the absolute maximum permitted to be in the dome is 25.

Ron Hoekwater

Amateur's alloy accentuated anxiety abated!

It's been three weeks since doctors armed with many power tools cut away my right ankle and replaced it with enough machined titanium to set off even more metal detectors; I already have a titanium shoulder replacement. At the hospital the doctor's admonishment not to walk without crutches for 6 weeks seemed reasonable. However, at the time I was hooked up to "drip morphine" and most everything seemed reasonable. Once discharged, sans my beloved IV, reality soon set in.

Reading helped to pass the time, but I still felt restless, especially as the new moon approached. E-mail foretold that PVAA had secured a wonderful new mountain site to observe from. I, on the other hand, could only browse through back issues of S&T, while encamped on my own mountain of pillows. And what was this slight anxiety that seemed to develop shortly after sunset? It was pretty obvious that I was suffering from a form of "separation anxiety disorder"- an Amateur Astronomer's separation from their telescope and the starry night! The cure was equally obvious, just a scan of the night sky and perhaps some quality eyepiece time?

I managed to "heal" myself by hobbling outdoors on crutches and making a few of the following chronicled observations. During the last of August I watched the distance between Venus and Jupiter close, until the evening of Sept. 1st. On that date there was approximately 1 degree separation- yielded a spectacular view with binoculars. Those two planets will eventually straddle Spica and the Moon.

The very ruddy Mars comes up at around 11pm, and by 1am is in a better viewing position. I very awkwardly set up my 90mm refractor and found that at near zenith, with steady seeing, I could almost make out some features on the surface. While straining to grasp any visual clues, my mind also pondered the fact that we have two rovers on roughly opposite sides of that rusty disc. I tried to envision the collective 6.5 miles of twin tire tracks eventually leading up to those two machines. Further, these two golf cart sized rovers are still moving across the Martian soil. The planet will be closest us on October 30th of this year (43 million miles) and will be fully illuminated (20") on Nov. 7. At that time one shouldn't have much trouble making out major features when a much larger Mars, currently shining at a mag. –1.0, "beams" in at an estimated –2.33 magnitude!

Mars (the god of war) has been a good early morning object for a while, but during the mid to later part of August, notably on the 21st, Mercury was also visible. Mercury's "day" is 58.7 earth days long, with one orbit around the Sun (a "year") taking 87.9 earth days to complete. On that morning of the 21st Mercury also joined Saturn (mag. .2) and the neighboring 1000 mi. diameter rock Sedna, a contrasting finale to an early morning celestial watch.

It had been many years since I had attempted to find planets Uranus and Neptune in the city and even then, I used a telescope. Because most of my observing was now through my trusty 10x50 binoculars, I decided to challenge myself. Could I find the gas giants in the highly washed out city night skies- using only Binos? I can report success, once armed with a few star charts and a little patient star hopping.

Amateurs have realized for many years the joy binoculars can bring. But factor in some crutches and you'll immediately declare binoculars are your best astronomical instrument!

Bob Akers

Andromeda's Other Companions

The Andromeda Galaxy (M 31) is one of the objects most looked at by amateur astronomers. For observers in the Northern Hemisphere, the Andromeda Galaxy is the only galaxy (excluding our own Milky Way Galaxy) which is visible to the unaided eye. It is also the closest large galaxy and the closest spiral galaxy. It is somewhat larger than the Milky Way, but otherwise the two are very similar.

At our most recent club star party I was looking at M 31 with both binoculars and with the 22-inch Starsplitter. The star party was at Blue Sky Meadow, which has an elevation of just over 8,000 feet. Towards the northwest, the sky in the vicinity of Andromeda was reasonably dark. I was looking at M 32 and NGC 205 (M 110), the two companion galaxies of M 31. (Probably most of you reading this have seen these two galaxies many times.) Then, while gazing at these two, I remembered that M 31 has two other less well known companions. It had been some years since I last looked at these other two companion galaxies so I decided to look them up.

NGC 185 was the easier of the two galaxies to spot. NGC 147 is much lower surface brightness and took a little longer to find. Neither galaxy was difficult to see in the 22-inch. However, I have read that due to its low surface brightness, NGC 147 can be quite difficult in less than a 12-inch scope. The following (very long) web address has a photo of M31 and all four companions together: www.astro.univie.ac.at/~exgalak/koprolin/Photo/Gal/M31_and_Friends_135mm.html. This website has a diagram along with other information about the Local Group: http://

en.wikipedia.org/wiki/Local_Group.

NGC 147 and NGC 185 are both in the constellation Cassiopeia. NGC 185 is magnitude 9.2 and was discovered by William Herschel on November 30, 1787. Later William's son, John discovered the magnitude 9.5 NGC 147 on September 8, 1829. In 1944 it was Walter Baade who first recognized that NGC 147 and NGC 185 were members of the Local Group, when he resolved them into individual stars using the 100-inch reflector on Mt. Wilson.

As I was reading about this subject on the Internet, I learned that Andromeda may have still more companion galaxies in addition to the four already mentioned, although most of these others are unlikely to be visible through the eyepiece of an amateur telescope.

Eva Grebel and Raja Guhathakurta observed two faint galaxies, Peg sSph (aka Andromeda VI) and Cas dSph using the 10 meter Keck II Telescope. In 1999 they announced their finding, that these two galaxies are companions of Andromeda.

In 2003 astronomers Heather Morrison, Paul Harding, Denise Hurley-Keller, and George Jacoby discovered a new galaxy, Andromeda VIII. The newly found galaxy is very diffuse as it is being torn apart by M 31's gravity. As the new galaxy orbits around the Andromeda galaxy it leaves a trail of stars strung out along its path.

According to the SEDS website, "one of the small Local Group member galaxies, LGS 3, is possibly a satellite of M33, which itself may be a remote but gravitationally bound companion of M31." M33 is certainly visible in an amateur telescope.

Next time you are out at some dark sky site you may want to look for some of these other companions of Andromeda.

Ron Hoekwater

Barnes & Noble Star Party

PVAA and Barnes & Noble will be having a public star party at the Barnes and Noble on the North side of Foothill, (next to Best Buy) in Rancho Cucamonga. The date will be Thursday, October 13th. It will start at twilight, but if some of you with solar telescopes would care to come out earlier, that would be great. We have had good turnouts from the public and have gained some new members from these star parties in the past. I hope many of you will be able to attend.

Ron Hoekwater

Bill Dean To Speak On Solar Observing

At our September 16th meeting, Bill Dean of Coronado Technology Group (the manufacturers of Coronado solar telescopes) will speak to us on solar observing. Mr. Dean designs and builds solar telescopes. He is a regular attendee of the Texas Star

INFARED EYE IN THE SKY

While much has been said about the now aging Hubble Telescope, less is publically known about other orbiting telescopes. Probably this is because Hubble sees in visible light, but the Spitzer Space Telescope for example, sees in wavelengths invisible to the human eye. It just doesn't produce any pretty coffee table book photographs.

Launched in August, 2003, NASA's Spitzer Space Telescope may be the last of the Great Observatories Program which included the Hubble, along with the less well known Compton Gamma Ray Observatory and Chandra X-ray Telescope. Each sees a different part of the electromagnetic spectrum. Gamma rays, observed by Compton, are the shortest in length and highest in energy. X-rays, observed by Chandra are not much longer. They all allow a view into the "high energy universe" of supernova remnants, matter squashing into black holes, and super hot gases. Spitzer can see temperatures of objects that would seem very cold to us. It can penetrate dust opaque to visible light, looking into cosmic clouds and seeing galaxies so distant their wavelengths are too short or long for "normal" telescopes. Spitzer allows a deeper peek into the Universe's past.

In the two years of its existence, Spitzer has uncovered warm steller embryos, chaotic planet-forming disks, secret black holes, remnants of dead stars, and evolving planetary systems. It hard to decide which discovery is the strangest one.

Its first discovery was a new globular cluster hidden by the Milky Way. A recent finding is the existence of a dense asteroid belt around a star like our sun, called HD69830. Not a well known star, it's about 41 light years away. Is it crushed asteroids or a planetary construction zone?

This remarkable telescope was named after pioneer astrophysicist Lyman Spitzer Jr. who first suggested putting telescopes in space. Before that is was called SIRTF, the Space Infrared Telescope Facility. It was a good name change.

Spitzer has 3 primary instruments: the Infrared Array Camera (IRAC), the Multiband Imaging Photometer for Spitzer (MIPS), and the Infrared Spectrograph (IRS). It's all very finely tuned work. IRAC observes in 4 near infrared wavelengths, 3.6, 4.5, 5.8 and 8.0 microns. The wavelength range for human eyes is about 0.4 to 0.7 microns, 1 micron is a thousandth of a millimeter, and the thickness of a human hair is about 100 microns.

The most recent job of Spitzer has been an analysis of the dusty plumes thrown off by the Deep Impact collision with Comet Tempel 1. Spitzer offers spectral images of cosmic particles at infrared wavelengths undetectable to telescopes on the Earth's surface.

Still going after two years, Spitzer continues to provide the deepest infrared observations ever taken. It has opened a secret vault of scientific data that will be analyzed for generations to come. Who knows what weird ***"invisible" cosmic oddity will turn up next?*** ***Lee Collins***

PVAA Trip to Mt Wilson

On August 21, the Club had its first trip to Mt Wilson during the daytime. For all our other trips, we have arrived at dusk – with just enough time for a quick view of all the instruments on the mountain before entering the dome of the 60-inch telescope for an all night viewing session. Well this time 13 of us gathered together at 11am at the pavilion above the parking lot. We walked up the hill and met up with Mike Simmons, our tour guide.

Mike led us on a fascinating trip into the seldom seen control rooms of the solar facilities on Mt Wilson. Our tour started with the two operators at the 150 foot tower. While most of the data gathered in this room is electronic, we were able to see a huge visible light image of the sun and could pick out a few sunspots on the surface. Our next stop was the 60 foot solar telescope. Several different studies are taking place at these two telescopes. One instrument studies the Doppler shift of the sun's surface as it moves toward and away from us – gathering data for scientists studying in the relatively recent field of helioseismology (also known as the study of "sun-quakes"). Another one looks at the spectra of the sun. Magnetic field changes are also observed and sunspots are examples of sites with strong fields. Their dark color is due to their relative coolness at 5,000 K compared to the rest of the sun's surface at 6000 K. They are areas of intense magnetic activity and tend to appear in pairs – one a North pole and the other a South. Their usual lifespan is about two weeks.

Those of us who have been involved with computers through their rapid evolution over the last 30-40 years were surprised at the vintage of some of the equipment still in use on the mountain. We saw tape drives used until a few years ago which pre-date today's storage mediums of CDs and DVDs. Some of the computers looked like the 33 and 66 megahertz machines I used during the mid-1990s. We heard how the technician's years of experience keep all the hardware and software to perform the scientific studies running on a shoestring budget. As long as their expertise is available, maintaining existing configurations is easier and certainly cheaper than the risky switchover to more modern equipment – with the necessary calibration to ensure the integrity of the observations between old and new systems.

Now, when the data leaves Mt Wilson for the offices of the scientists down the hill to study, it enters the world of high speed processors, speedy data transfer rates, and the expertise of those studying cutting edge theories in Physics and Astronomy – but I think the experience and craftsmanship of those who keep the data flowing from the mountain is just as valuable to the scientific process as the value added by those down below.

Then we entered the really low tech world of the Snow Telescope, brought to Mt Wilson by Helen Snow in 1904 from the University of Chicago's Yerkes Observatory in Williams Bay, Wisconsin. The configuration of this instrument is horizontal, rather than vertical as in the first two solar scopes we saw. It is also a much more manual process to operate it – we watched as Mike hand cranked the shed off the telescope's mirrors, hand aligned the mirrors, and set the weight driven clock drive whirring so the sun's path through the sky could be tracked. Being able to see the complete light path was a treat not often seen today and we were excited to hear of hopes to bring school aged budding scientists to see this instrument in operation. The operation of the Snow was so plain to see – much better that the usual black box feel of observing equipment; inexplicable without the light path diagram. We wish good luck to efforts to use this instrument for the education and inspiration of tomorrow's scientists. We all especially got a kick out of the operation of the DC power system which clacked and sparked every time Mike sent a command via the thick cord from his big push button controller.

The final stop with Mike was to the floor and inner workings of the 100-inch Hooker telescope. We marveled at the huge gears and at the multitude of air bubbles in the greenish glass of the mirror which many at the time thought rendered it useless. First light from the telescope was disappointing with very poor image quality but it turned out, fortunately, that this was simply due to temperature instability in the recently set up system. A second view the next night proved the skeptics were wrong as beautiful sights were seen through the new instrument – largest in the world from 1917 until 1948, when it was replaced by the 200-inch at Mt Palomar. With its resolving power of 0.05 arc seconds, Edwin Hubble first realized that many of the objects called nebulae were actually galaxies outside of the Milky Way. Along with others, he also observed the red shift which is evidence of our expanding universe. While the telescope was inactivated in favor of more modern instruments in 1986, it was fitted with adaptive optics and restarted in 1992. It remains in use today.

A quick stop at the Mt Wilson museum to look at images obtained by telescopes on the hill ended our almost 5 hour visit to Mt Wilson. We had such a good time we hadn't noticed how hungry we were so Ron, Laura, Lucy and I ended a great day at a café in Pasadena. Many thanks to our knowledgeable tour guide, Mike Simmons, and to the telescope operators who shared their work sites with us. We left with a great appreciation of the history and science which has taken place and which still occurs from the telescopes

atop Mt Wilson.

Claire Stover

PVAA Club Dues Are Overdue

The club dues should have been paid by the end of August, but the announcement is a month late.

The dues are $30 for an individual. and $40 for a family membership.

Please pay at the General Meeting.

If paying by mail send the check to:
PVAA
P. O. Box 162
Upland Ca 91785
Attention Treasurer

About Deep Impact

The LA Times had a couple of interesting articles about the Comet Tempel 1, and Deep Impact.

The first was how NASA was able to hit the comet in the right place.

Because a comets path is not predictable as a result of its rotation and that it is emitting gas like a small rocket, they had to devise a way of navigating the spacecraft remotely.

The spacecraft consisted of two parts. The Impactor, its purpose was to crash into the comet, and the other part called Flyby, whose purpose was to observe the event.

The Impactor was equipped with a computer program called "AutoNav" (short for Autonomous Navigation). AutoNav analyzed the images from the spacecraft's camera to figure out the right spot, and the software caused the main engines to make the proper course corrections.. Without AutoNav the Impator would have missed the comet. Actually, two course corrections were made. The Impactor would have missed after the first correction.

More information about AutoNav and Deep Impact can be found online at *spacelace.nasa.gov*.

The other article was about the analysis of Deep Impact. The Impactor penetrated the comet 30 feet or more, and blasted a crater more than 100 yards long.

The comet is really a snowy dirtball, made mostly of dust. However, mixed in the dust were molecules of potentially life-spawning organic compounds. Methyl cyanide, hydrogen cyanide, amonia, and acetylene were detected. The findings support the theory that comets seeded the Earth with the precursors of life.

The outer surface is unbelievably fragile. The comet is very porous. An infrared spectrometer charted a comet's surface temperature for the first time, and that the nucleus of the comet is very porous with as much as 80% empty space, like a sponge. The data showed that there was more dust than ice in the comet. they think that the dust could make up from 50% to 90% of the comet.

The fluffyness of the comet might be trouble for a 2014 mission to soft land on a comet. Based on the experience with Deep Impact, a probe would not land on the surface, it would sink into the comet .

The following remarks are my opinions about comets. Considering that a comet accumulates material as it travels through space, it collects dust and molecules of matter. As this occurs, it obtains a force of gravity from the material collected. If the comet becomes large enough,the force of gravity will be stronger, and the comet will become more dense. Apparently Comet Tempel 1 is not large enough to have sufficient gravity to have a dense composition.

Comet Shoemaker-Levy 9 which crashed into Jupiter was dense and large enough to to cause considerable damage to Jupiter.

Ray Magdziarz