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# nightwatch

Newsletter of the Pomona Valley Amateur Astronomers

Amateur  
astronomers  
just get better  
looking . . .

**The general meeting will begin at  
7:30 P.M. in Galileo Hall**

Volume 24 Number 12

*nightwatch*

December 2004

## President's ADDRESS

On January 15<sup>th</sup> at 3:00 PM PVAA will tour the Einstein exhibit at the Skirball Cultural Center in Los Angeles. The Skirball Cultural Center website states, "Visitors to the exhibition can examine Einstein's report card, inspect his FBI file, and enjoy his family photographs, love letters, and diary entries. Exhibition highlights include scientific manuscripts and original correspondence—including original handwritten pages from the 1912 manuscripts of the special theory of relativity and his 1939 letter to President Roosevelt about nuclear power—and a wealth of other documents." This promises to be an excellent opportunity to learn more about one of history's great scientists.

If you would like to go and have not already put your name on the sign up sheet contact me either by phone, (909) 391-1943 or by e-mail, astro.ron@juno.com. There will be a \$10.00 per person admission fee. Make checks payable to PVAA. Payment can be sent to the club PO box or paid the day of the tour.

The address of the Skirball Cultural Center is 2701 N. Sepulveda Blvd. Los Angeles. Exit the 405 Freeway at Skirball Center Drive. Plan to

arrive 15 minutes early.

Also, if you have not yet renewed your PVAA membership be sure to do that soon! Again, checks should be made out PVAA.

*Ron Hoekwater*

### Star Party Sites

(MBC) Mecca Beach Campground (see page 4)  
(CS) Cottonwood Springs campgrnd, Josua Tree Ntl. Pk  
(CC) Cow Canyon Saddle, Mount Baldy Village  
(MS) Mequite Springs campgrnd, Death Valley National Pk  
(CWP) Claremont Wilderness Park parking lot  
(KD) Kelso Dunes  
(WM) White Mountains  
(CGT) Calico Ghost Town Campground

### PVAA Events Calendar

Month	Star Party	Star Party	General Meeting	Board Meeting
Dec	CWP	11	3	16
Jan	MBC	8	21	13
Feb	CGT	5	25	17
Mar	MS	5	18	10

**November General Meeting**

Visitors threatened to outnumber members at our November meeting, as 11 new faces joined us. Four individuals were from the general community, including an Ontario City Library employee and another with past connections to an observatory in Tempe, Arizona. The other seven were lured to our meeting by both an interest in astronomy and an interest in extra credit in their astronomy class from our speaker for the evening. Whatever the motivation, we were glad to have them all and hope they enjoyed the evening.

We were reminded of our group tour on Saturday, January 15 at 3pm of the exhibit on the life and science of Albert Einstein at the Skirball Cultural Center in Los Angeles and of a star party coming up early next year, on Wednesday, February 16<sup>th</sup> at Sycamore Elementary School in Upland. We were also invited to another school star party for Mountain View Elementary School in Azusa on Tuesday, December 14<sup>th</sup> by John, our visitor from the Tempe Observatory. Attendees have been promised a pizza dinner. Ron plans to be there, please contact him or see our web site for further details. We hope to see many of you at these special events to broaden your own horizons and to share your knowledge of the sky with others.

I showed the Club an overview of our new Web site: [www.pvaa.us](http://www.pvaa.us). Visit often for details and maps to future events. Please let us know if you have suggestions for additions to the site.

Lee Collins' What's Up reviewed the Messier object rich area of the sky stretching from Polaris to Sirius. M1, or the Crab Nebula, is here in Taurus. Observed and recorded only by the ancient Chinese, the Nebula was created by a supernova explosion in 1054 AD. Changes have been observed in the appearance of this relatively recent object over just the last century. Included in Lee's handout was a map of the nine most prominent objects among the seven sisters of the Pleiades – perhaps the last two are the younger brothers?

**Featured Speaker**

Our speaker for November was Dave Kary, Astronomy professor at Citrus College. Dave spoke to us about the solar system – a description of our own, the model for its creation, and the very recent discovery of systems orbiting other stars.

Our own system has historically been the only one we could observe and study. After our sun, which contains 99.8% of the mass of our solar system, it is made up of the rock and metal terrestrial worlds of Mercury, Mars,

Venus, and Earth. Due to the high melting points of their components, they condensed out of the ancient dust fairly close to our new Sun, in the relatively warm neighborhood of our solar system. Farther out condensed the Jovian planets of Jupiter, Saturn, Neptune, and Uranus. Despite their common name, gas giants, they should be referred to as the liquid giants. The pressures on these planets are so high that they are mainly composed of liquid hydrogen and helium along with liquid water, methane and ammonia compounds.

In and around these major bodies at the inner solar system by the gravity of the sun, giving us a spectacular show on their way by. Pluto is thought to be a rather large example of one of these objects.

The other common factor distinguishing Jovian from terrestrial planet is in their number of moons. The planets in our neighborhood share only three moons among them, while the liquid giant planets share over 100 – actually forming as mini solar systems in their own right. Jupiter alone has more than 60 moons discovered

**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](http://www.pvaa.us)**

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so far.

We then have a couple of unusual objects which should be accounted for in any theory of solar system formation. One is the planet Uranus which orbits the sun with its axis tipped almost to the plane of its orbit. The other odd object is our very own moon. It stands out for both its large size relative to the Earth and its composition – mostly rock with very little metal.

The current theory of solar system creation is called the Safronov Model. It postulates the re the rock and metal asteroids located mainly between the orbits of Jupiter and Mars, and the rocky, icy, and organic comets which either hang out past the orbit of Neptune in the Kuiper Belt – occasionally lured method by which star systems form within clouds of interstellar dust and gas. Formation is successful when gravitational forces win out over gas pressure's expansionary force. It generally occurs in relatively dense and cool clouds. The mass contracts and spins faster and faster, as system's momentum is conserved. Planets form through accretion as the dust collides and combines to form ever larger bodies. Collisions at slow speeds are more likely to result in the objects combining while those between fast moving ones usually result in the material in both being broken apart. With just the right starting conditions such a collision event between two very large objects may have created our own Earth-moon duo.

Planets outside our solar system have been discovered in two ways. One is by measuring the motions of their parent stars and observing wobble in their orbits following Newton's Third Law of Motion, that every action produces an equal and opposite reaction. Just as the gravitational tug of the star holds the planet in its orbit, so does the planet have a small but measurable effect in return on its star. This small wobble of the star can be detected over the time period of the planet's orbital period using the Doppler shift as its wavelength shifts slightly to the red or the blue as it wobbles slightly towards or away from Earth.

The second method of finding planets is to detect the brightness changes in the parent star as it eclipsed by its satellites. The change is small, about 2%, but still detectable. These techniques have proven fruitful; even without any direct observation, evidence for over 100 planets has been found. Just two months ago, Astronomers have advances a level of sensitivity and have gone from being able to detect planets only Jupiter-sized and larger to being able to find those the size of Neptune.

The continued discovery of these extra-solar systems will allow us to come full circle and better explain the creation of our own local system. We will also find

many different types of planetary systems which will stretch our knowledge of the wide range of possibilities that exist in the universe and expand our theories to explain their formation. Thank you, Dave, for a very interesting talk.

**Claire Stover**

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#### CASSINI-HUYGENS VISITS A LORD OF THE RINGS

In 1610, Galileo with his tiny telescope thought Saturn was three planets in a row. Later, when the rings were edge on, the two outer smaller planets suddenly disappeared. Galileo hated Saturn.

In 1655, with his improved telescope, Christiaan Huygens figured out the true halo-like form of the rings. He also discovered its king size moon, which he gave the titanic name of Titan. Perhaps because it's 3,200 miles in diameter, Titan is the only moon in the solar system with an atmosphere.

In 1675, Giovanni Cassini discovered the biggest ring gap, now named after him. He concluded that a division into two rings meant that the rings were made up of small particles and not solid. By now, Saturn is known to have over 1000 separate rings.

In 2004, after a 7 year voyage of 2.2 billion miles at a speed of 4 miles per second, the probe named for these two pioneers has arrived at the ringed giant.

In June, this largest and most expensive probe of all arrived at Phoebe, the 130 mile wide outer moon. Impressive photos show a rugged, cratered ball of ice and rock spinning in a retrograde orbit. This suggests a captured wanderer from the outer realms of Pluto, the Kuiper Belt. Phoebe is an icy relic of the earliest solar system.

Moving toward its planetary orbit, the probe passes the 900 mile wide Iapetus with its huge black mark that shockingly covers nearly half the otherwise white icy moon. Perhaps the blackened crash mark of a giant comet. Then the probe discovers two tiny new moons. The total number is now over 30. Next it photographs the impact riddled surface of 650 mile wide Tethys. Then the striking 247 mile wide inner moon Mimas with its nearly moon shattering 80 mile wide crater (Herschel) that makes it look like the Death Star from Star Wars.

As it's been inserting itself into orbit, the probe has been photographing the ring system, showing complex salmon, blue, gray, and brown colors. Some rings are older and dirtier than others. Since the rings are mostly water ice, the colors are compared to watercolor tints.

The orbits of the rings are influenced by Saturn's magnetic field and by tiny embedded moons called shepherds. The planet's magnetic field seems to produce the rings weird cross grain "spokes" that flicker like dark ghostly ripples. Even moons outside the rings cause gravitational resonance waves and gaps similar in shape to oscillations on the surface of a pond.

The shepherd moons are tiny ring embedded satellites given theatrical names like Pan, Prometheus, and Pandora. They

clear and create ring gaps with their orbital physics. They herd ring particles together on either side, rather like a boat cruising through water creates an open wake with swirls and scallops on its edges. Some rings are even braided and knotted in strange ways that challenge explanation. It's now known that Jupiter, Uranus, and Neptune also have faint rings. This proves that rings on giant planets are probably common in the Universe.

But let's not forget Saturn itself. The giant still holds, beneath its relatively predictable surface weather (compared to Jupiter), violent electrical storms of gigantic size.

However, smog shrouded Titan still arouses the most curiosity. Is it an analog of Earth, but a deep frozen one? Compared to the other moons, Titan doesn't seem to show any impact scars. This indicates a geologically active surface. Bright features with exotic names like Xanadu remain mysterious. But the surface has only been seen through haze reducing filters. Will it have foggy lakes of liquid methane, or a dry crunchy cold crust? It could be snowing hydrocarbons. On Christmas Day, the Huygens probe will separate from the Cassini orbiter. Then, it will plunge into Titan's thick atmosphere taking measurements and trying to land. If it lands, Titan will become the most distant world touched by human craft. Only then will the veiled secrets of this huge moon be revealed.

Lee Collins

### December Star Party

The PVAA star party for the month of December was close to home, in the north parking lot of Claremont Wilderness Park. The Wilderness Park's north parking lot is immune to the headlights of the Baldy Road traffic, which so afflict the south parking lot. The sky is surprisingly dark for a site at the edge of town.

When I arrived it was nearly dark enough to start observing. Craig Matthews and Frank Busutil were already set up and talking astronomy with passing hikers. One family of passers-by showed great interest and later returned to see some of the evening's sights, visible in an amateur telescope. At about 11:00 PM, club members Laura Jaoui and her son Michael came out for a little observing. An amateur astronomer and friend of Craig also joined us for part of the evening.

Highlights of the night's viewing were Saturn, the Orion Nebula, the Pleiades star cluster, the Crab Nebula, and the Ring Nebula. While trying out a new camera, Craig obtained a particularly impressive image of the Ring Nebula.

Before midnight, we were all packed up and headed for home. (One of the advantages of the local star parties is that you get to sleep in your own bed.) All in all it was a very enjoyable evening.

January's star party is on the 8<sup>th</sup> at Mecca beach Campground. Mecca Beach is a little closer than Cottonwood Springs, about as dark, and a whole lot warmer. I hope to see some of you out there.

Ron Hoekwater

### COMET MACHOLZ C/2004 Q2

I just got in from 5 mins of stargazing and thought I'd alert you to something remarkable, in case it felloff anyone's "radar screen"- it did on mine. Comet Machholz (C/2004 "Q2") is VERY visible from everyone's back yard. Located near to Orion, it is quite obvious with 10x50s (mag 5.1) I am amazed I hadn't been following this one very well, but apparently it is going to get better/brighter. I included a JPEG chart I used to starhop- shouldn't change much for a few nights.

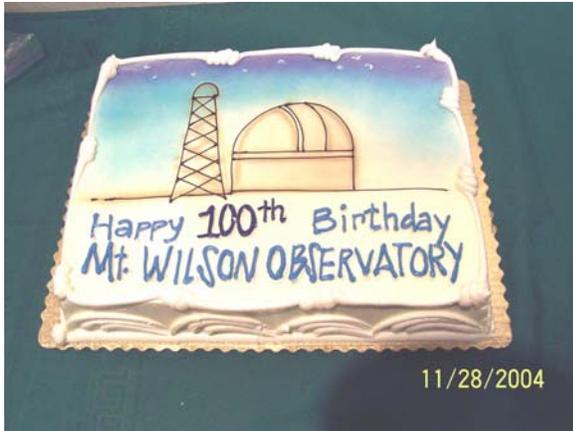
Bob Akers

Comet Machholz, C/2004 Q2

D <sup>o</sup> UT	RA	Dec.	Const.	Mog.	Distance from Earth (a.u.)	Distance from Sun (a.u.)
Nov. 21	5 <sup>h</sup> 05.5 <sup>m</sup>	-29° 33'	Col	6.8	0.75	1.56
Dec. 1	4 <sup>h</sup> 54.4 <sup>m</sup>	-26° 55'	Eri	6.1	0.62	1.47
Dec. 11	4 <sup>h</sup> 38.0 <sup>m</sup>	-21° 08'	Eri	5.5	0.51	1.39
Dec. 16	4 <sup>h</sup> 28.0 <sup>m</sup>	-16° 29'	Eri	5.1	0.46	1.36
Dec. 21	4 <sup>h</sup> 17.2 <sup>m</sup>	-10° 20'	Eri	4.7	0.41	1.32
Dec. 26	4 <sup>h</sup> 05.6 <sup>m</sup>	-2° 31'	Eri	4.5	0.38	1.29
Dec. 31	3 <sup>h</sup> 53.8 <sup>m</sup>	+6° 51'	Tau	4.3	0.36	1.27
Jan. 3	3 <sup>h</sup> 46.6 <sup>m</sup>	+13° 02'	Tau	4.2	0.35	1.25
Jan. 6	3 <sup>h</sup> 39.6 <sup>m</sup>	+19° 27'	Tau	4.1	0.35	1.24
Jan. 9	3 <sup>h</sup> 32.7 <sup>m</sup>	+25° 51'	Tau	4.1	0.35	1.23
Jan. 12	3 <sup>h</sup> 26.1 <sup>m</sup>	+32° 05'	Per	4.1	0.36	1.22
Jan. 15	3 <sup>h</sup> 19.8 <sup>m</sup>	+37° 58'	Per	4.2	0.37	1.22
Jan. 20	3 <sup>h</sup> 10.2 <sup>m</sup>	+46° 47'	Per	4.3	0.40	1.21
Jan. 25	3 <sup>h</sup> 02.0 <sup>m</sup>	+54° 15'	Per	4.5	0.44	1.21
Jan. 30	2 <sup>h</sup> 55.7 <sup>m</sup>	+60° 28'	Cas	4.7	0.48	1.21
Feb. 4	2 <sup>h</sup> 51.8 <sup>m</sup>	+65° 41'	Cas	4.9	0.52	1.22
Feb. 9	2 <sup>h</sup> 51.1 <sup>m</sup>	+70° 05'	Cas	5.2	0.57	1.23
Feb. 19	3 <sup>h</sup> 05.3 <sup>m</sup>	+77° 10'	Cas	5.7	0.67	1.27
Mar. 1	4 <sup>h</sup> 07.1 <sup>m</sup>	+82° 29'	Cep	6.2	0.78	1.32
Mar. 11	7 <sup>h</sup> 12.6 <sup>m</sup>	+84° 52'	Cam	6.7	0.88	1.39
Mar. 21	10 <sup>h</sup> 07.2 <sup>m</sup>	+82° 18'	Cam	7.1	0.98	1.47
Mar. 31	11 <sup>h</sup> 11.6 <sup>m</sup>	+77° 39'	Dra	7.6	1.08	1.56
Apr. 10	11 <sup>h</sup> 40.0 <sup>m</sup>	+72° 29'	Dra	8.1	1.19	1.66
Apr. 20	11 <sup>h</sup> 57.2 <sup>m</sup>	+67° 08'	Dra	8.5	1.30	1.76
Apr. 30	12 <sup>h</sup> 10.1 <sup>m</sup>	+61° 46'	UMa	9.0	1.42	1.86
May 10	12 <sup>h</sup> 21.3 <sup>m</sup>	+56° 28'	UMa	9.4	1.56	1.97
May 20	12 <sup>h</sup> 31.8 <sup>m</sup>	+51° 21'	CVn	9.8	1.70	2.08

**Mt Wilson Observatory is 100 Years Old**

The Mount Wilson Observatory just celebrated it's 100th anniversary. The Mount Wilson Institute had a birthday party at the Altadena Public Library for the observatory.



The presentation at the event was a preview of a documentary being developed on the life of George Ellery Hale. It is expected to be shown on the PBS TV stations in about a year or so. They researched their material so thoroughly that they got baby pictures of Hale, home movies of him and his father, and his family. They interviewed the authors of four books which covered the exploits of George Ellery Hale.

He and his father had their own Kenwood observatory in the Chicago suburbs. In getting the still largest refractor telescope, The Yerkes at Williams Bay Wisconsin, Hale had to deal with Charles Tyson Yerkes, the man who cornered the public transportation system in Chicago. It seems that no one liked him, and he was difficult to get along with. But Hale got him to finance the telescope. During the Chicago Century of Progress, the 40 inch complete telescope without lens was on display in at the time, the largest building in the world, the Manufacturing and Liberal Arts Building. Nicaragua honored him with a postage stamp showing Hale and Copernicus. Hale also was responsible for the 100 inch Hooker reflector and the 200 inch on Mt Palomar.

*Ray Magdziarz*

**2004 Holiday Dinner Party**

Here are the pictures of our Holiday Dinner Party. John and Lucy Stover entertained us with mandolin and flute music. Everyone had a good time, and everyone got a door prize.

The meal was very good and the plates were full to almost overflowing. In fact Irene and I finished our chicken the following day

*Ray Magdziarz*



