

Vandenberg Amateur Astronomical Society
presents
The Sidereal Times



M45 Pleiades (The Seven Sisters)
Larger image on page 5.

Meeting News:

Meeting started at 5:40PM at Mi Amore restaurant in Lompoc. Had a good turn out, 16 total. Confirmed club officers for 2012 operating year.



Lunar Calendar:

First Quarter: 1 January
Full Moon: 9 January
New Moon: 23 January

Presidents message

.Happy New year!

The December meeting at Mi Amore was a big success and everyone had a good time.

There has been a significant effort to troubleshoot the observatory dome rotation system. (See special topic in this newsletter).

At the January meeting we'll introduce the "new" officers and also collect annual dues.

This time of year the night sky is dominated by 2 bright planets, Venus and Jupiter. Early in the month Venus and Neptune will be close to each other in the west due to Venus's retrograde motion. Jupiter will be high overhead in the early evening sky. Mars will rise just before midnight and Saturn follows about an hour later. Later in January Venus will be moving towards Uranus in the early evening sky.

Reminder: Dues are due for 2012. Please submit your membership dues at the club meeting or to Liberty Partridge or Craig LeClair to retain membership status and continue receiving the Sidereal Times Newsletter.

VAAS web site that includes a discussion group. Vince Tobin runs the web site and sends reminders to those that have registered into the discussion group.

<http://tech.groups.yahoo.com/group/vaastronomy/>

Have fun and hope for clear skies.....Dave

Meeting News (Cont.)

We started the meeting about 5:30 PM at Mi Amore in Lompoc. We visited with most of the VAAS membership and had a very short business meeting.

The main focus of the meeting was to have fun and enjoy catching up on what each member has been doing.

The business meeting focused on election of club Officers of 2012, or stated another way, "Let the Annual railroad convention for officers Commence". The results were tallied and no Protests were filed.

So the results are official:

- President – Dave Covey
- Vice President – Vince Tobin
- Treasurer – Liberty Partridge
- Editor – Vahan Yeterian

Up Coming Events

January 3, 4 – Quadrantids Meteor Shower. The Quads Are an above average shower with 40 meteors per Hour at their peak. The shower usually peaks on January 3 & 4 but some meteors can be visible from January 1 through 5. The near first quarter Moon will Set shortly after midnight leaving dark skies for what Should be a good show. Best viewing will be from a dark location after midnight. Look for meteors radiating from the constellation of Bootes.

No Lompoc Nebula Please!



January 23 – New Moon.

The Moon will be directly between Earth and the Sun and will not be visible from earth. This phase occurs at 07:39 UTC.

Special Topic

Saturday 26 November.

Vince Tobin and Dave Covey met at the observatory on Saturday afternoon to determine what is going on with The dome rotation system. Vince reported that the last time he operated the observatory the dome rotation would "stall" shortly after starting to rotate. The stall was followed by a brief power outage of about 2 to 4 seconds.

We looked at the electrical connections, inverter voltage and Circuit breakers. They all seemed good to us. Then we tried Dome rotation several times, the more we exercised the rotation system the better it seemed to run. However, it would still stall and the power would briefly drop out then restore itself. The problem got worse as the evening progressed. The power inverter system does not appear to be the problem. Back to square one!

Friday 9 December

Dave went to the observatory to remove the dome drive electrical motor. He had a partial success in getting the work done but one of the 4 bolts holding the motor to the gear box was located in a very tight spot. The electrical wires were disconnected and tagged.

Saturday 10 December

Vahan Yeterian, Morrie Cobb and Dave Covey met at the Observatory to make another attempt to remove the motor. We had it and the gear box out within 15 minutes. We then examined the gear assembly to verify it was turning freely. Some of the gear box lubricant spilled on the concrete when The side panel was removed. Internally the gear assembly Looks in excellent condition, no binding or metal filings were noted.

The battery system was checked for any visible problems and Water added as required. We will need to replace the lube oil in the gear box prior to reinstalling the dome drive system. The dome can be manually rotated by hand, but it is not an easy task.

Perry's Electric in Santa Maria checked out the motor for us free of charge and stated the motor is fine. Likely problem might be too much load, bad switch, or low current.

Vahan suggests we lubricate the dome rollers and the track. Next time we go out to the observatory we hope to resolve The dome drive problem.

See Page 10 for current info.

Moon Phase:

January Moon

Moon Phases: January 2012						
Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
						1 
2 	3 	4 	5 	6 	7 	8 
9 Full 	10 	11 	12 	13 	14 	15 
16 	17 	18 	19 	20 	21 	22 
23 New 	24 	25 	26 	27 	28 	29 
30 	31 					

January 9th - Full Moon:

Moon Folklore

If the new Moon is from the North it will be cold for 2 weeks, but if it is from the South it will be warm.

In some Chinese religions offerings are made to the ancestors on the night of the full moon.

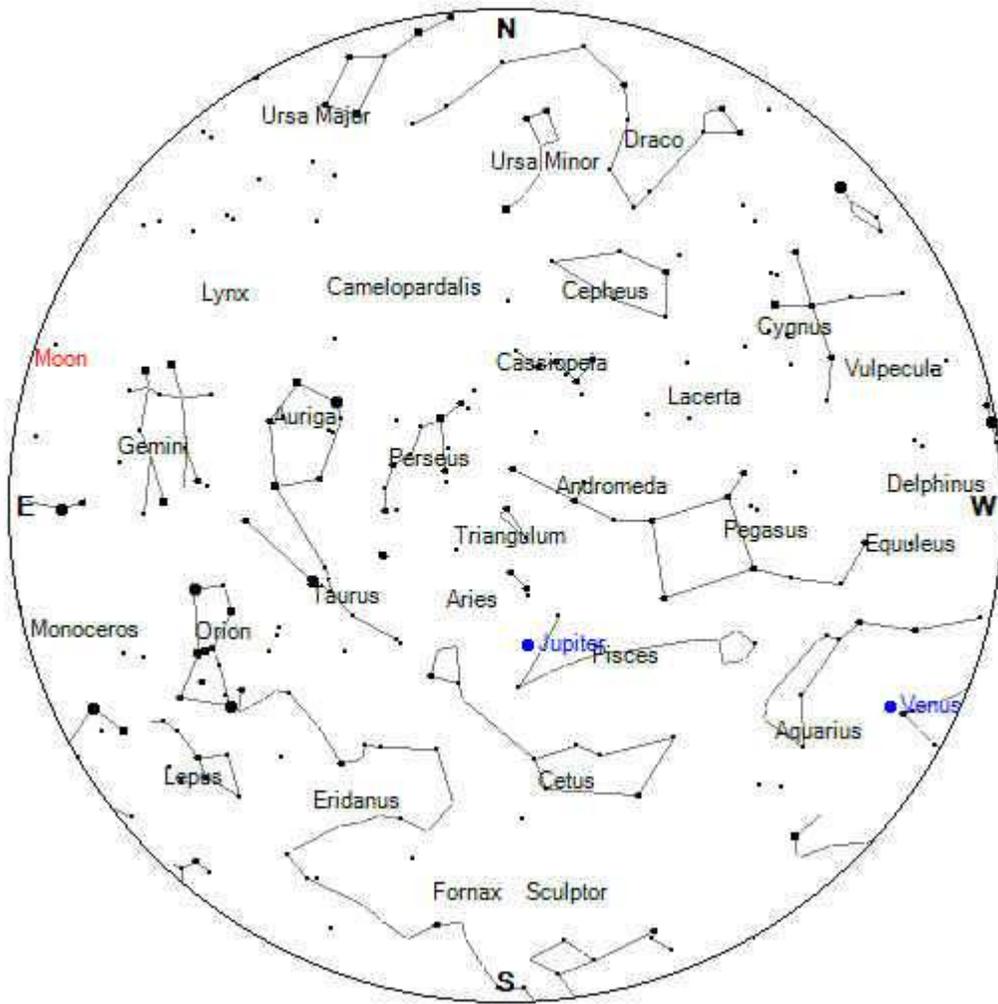
The word Lunatic comes from the Latin Luna because it was believed that people were more likely to exhibit aberrant behavior during a full moon.

Objects of interest

- Double cluster
- Planet Jupiter
- M42 Orion Nebula
- M1 Crab nebula

Sky Chart

48



Date/Time (Local Time)

Year:	<input type="text" value="2012"/>	Month:	<input type="text" value="1"/>	Day:	<input type="text" value="10"/>	Hour:	<input type="text" value="19"/>	Minute:	<input type="text" value="00"/>
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Picture of the Month M45 courtesy Gary Satterfield



The **Pleiades**, or **Seven Sisters** is an open star cluster containing middle-aged hot B-type stars located in the constellation of Taurus. It is among the nearest star clusters to Earth and is the cluster most obvious to the naked eye in the night sky. The cluster is dominated by hot blue and extremely luminous stars that have formed within the last 100 million years. Dust that forms a faint reflection nebulosity around the brightest stars was thought at first to be left over from the formation of the cluster (hence the alternate name **Maia Nebula** after the star Maia), but is now known to be an unrelated dust cloud in the interstellar medium that the stars are currently passing through. Astronomers estimate that the cluster will survive for about another 250 million years, after which it will disperse due to gravitational interactions with its galactic neighborhood. Image captured 2010 in fairly dark skies with a Williams optics Megrez90FD and Televue X 8 focal reducer/field flattener and a Hap Griffin modified Canon 350D riding on an auto guided Celestron CGEM mount. A total of 39, 7 minute frames @ ISO800 were dark calibrated in Images Plus and after initial adjustments, transferred to CS2 for final tweaks. A link to my photos. <http://astrobin.com/users/waassaabee/>

Back to Basics – How the Solar System Formed

According to the best data we have the Solar System was formed within the giant molecular cloud that gravitationally collapsed about 4.6 billion years ago. Before that this location of the galaxy was mostly a massive gas cloud, similar to the nebulas we can currently view in our night sky. The compression started the clumping of gas material within the giant molecular gas cloud to form the pre-solar nebula that would become our Solar System. As more and more material gravitationally clumps together the gas started to rotate into a generally flat disk due to conservation of angular momentum. The best example of the conservation of angular momentum effect is when an ice skater spins faster as he or she pulls their arms in to their body. This process normally produces very massive object in the center of the rotating gas cloud that becomes a proto star that would be our Sun. As the proto star is gathering the material in the gas cloud, other objects are also forming from the material that is not gathered by the proto star. This process of gathering material is referred to as accretion. Eventually these other objects become the planets that we know today.

Within approximately 50 million years the proto star's mass compresses to create enough pressure, density and temperature to start a thermonuclear fusion reaction in its core, it now becomes a star after it has stabilize the compression and reaction forces. Accretion process is really on for the remaining planet objects to grow in mass before the solar winds blow the remaining gas and lighter material away. It must have been a very chaotic with the Sun and planet objects competing gravitationally for the "unclaimed material" and the random collisions that ensued. The chaotic conditions generally ended with the late heavy bombardment period approximately 3.8 billion years ago.

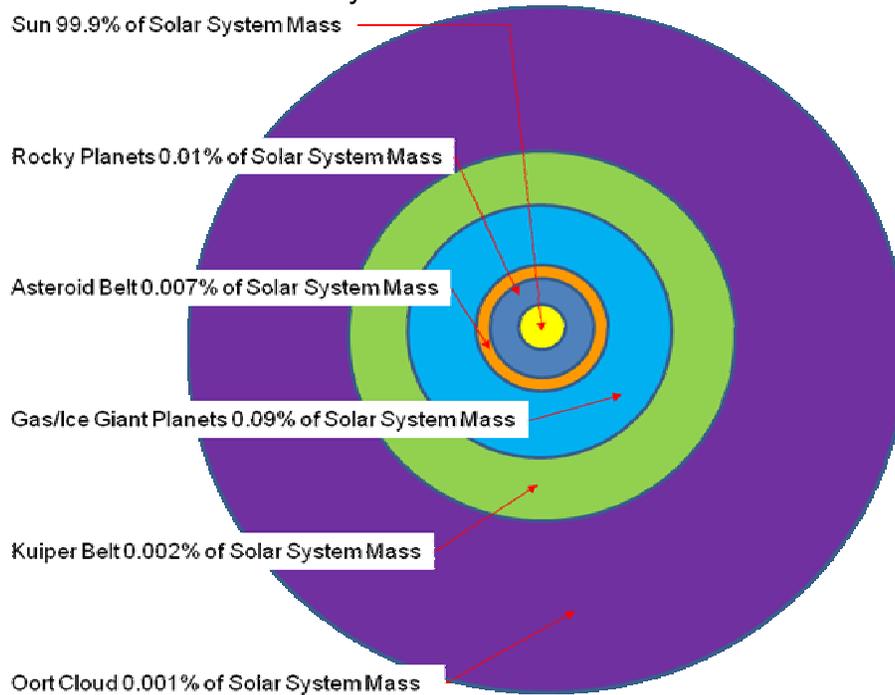
So the solar system as we now know it has divided itself into general zones starting from the center and going outward: 1st the Sun, 2nd the rocky planets (Mercury, Venus, Earth and Mars), 3rd the asteroid belt (such as Ceres, Vesta, Hygiea), 4th the giant planets of gas or ice (Jupiter, Saturn, Uranus and Neptune), 5th the Kuiper belt (such as Eris, Pluto, Quaoar, Varuna and Orcus) and 6th the Oort cloud (such as Sedna and still looking).

About 99.9% of the total mass of the solar system is concentrated in the Sun. The combined giant planets total is about 0.09% of the total solar system mass or about 99% of the remaining mass after the Sun. The combined rocky planets mass total is about 0.01% of the solar system mass or a little less than 1% of the remaining mass after the Sun. That doesn't leave much of the solar system mass in the asteroid belt, Kuiper belt and Oort cloud.

The final thought is the general orbit features for each zone as they orbit around the Sun. In general the rocky, giant planets and the asteroid belt have almost circular or low elliptical orbits that are in the same general plane about the Sun. This is referred to as the ecliptic. The Kuiper belt objects (likely source of the short period comets) have moderately elliptical orbits that are significantly tilted from the ecliptic plane. The Oort cloud (likely source of the long period comets) has highly elliptical orbits with a spherical distribution surrounding the Sun.

The general orbit features might be part of the reason why Pluto was recently reclassified from a planet to a Kuiper belt object or dwarf planet. It has an orbit that

highly elliptical and not in the ecliptic plane as the other planets. I won't go into the details or the philosophical discussion here. That I'll leave for the others such as the International Astronomical community to discuss.



Note: The percentages are approximate

Simplified Solar System Model

References

http://en.wikipedia.org/wiki/Solar_System

http://en.wikipedia.org/wiki/Solar_system_model

http://en.wikipedia.org/wiki/Late_Heavy_Bombardment

Some food for thought

Atmospheric Extinction

Is the reduction in the intensity of light from a celestial body due to absorption and scattering by Earth's atmosphere. It increases from the zenith to the horizon and affects short wavelengths more than long wavelengths so that objects near the horizon appear redder than they do at the zenith. The brightness of a star in the zenith will be reduced only about 0.3 magnitudes, whereas the extinction at 20 degrees altitude is about 0.9 magnitudes and at 10 degrees altitude about 1.6 magnitudes.

Atmospheric Refraction

Is the refraction of light rays passing through the Earth's atmosphere due to variations in the density and temperature that produce corresponding variations in its refractive index. Atmospheric refraction gives rise to a shift in the apparent direction of a celestial object, the effect increases the observed altitude of an object and is greatest (just over a half degree) for objects on the horizon. Unusual density variations close to the surface may produce mirages, shimmer and other deceptive effects.

Accommodation

Is the ability of the eye, or other optical instrument, to change its focus depending on the distance of an object. In humans a few other mammals, and in birds and reptiles, the accommodation occurs by changing the shape of the lens. At rest the lens is thin and focused for distant objects. to bring nearby objects into focus, the Ciliary Muscles contract causing the lens to become rounder (more convex). Most mammals cannot accommodate. In fish and amphibians focusing is achieved camera style by moving the lens backward or forward in relation to the retina. A young persons ability to accommodate allows him/her to see clearly far away and close up. At about age 40 the lens starts to become less flexible and accommodation is lost making close range work increasingly difficult. This condition is known as Presbyopia (need glasses).

Lunar Eclipse photos by Monica LeClair and Son Chris 10 Dec 2011



Monica, Canon Rebel T3i

Chris, Canon Rebel T2i

Club Meeting and Christmas Party At Mi Amore 9 Dec 2011





Dome Drive Gear box

Dave, Morrie and Vahan verifying the Dome drive Gear Box (transmission) is free and clear of binding. Oops! A little oil spill.



An update on the dome rotation motor. The repair shop checked out the motor and found it to be functioning. This type motor doesn't have brushes like we thought. I talked to the technician a little and after describing the trouble, he recommends that we check the rotatory switch. It might need cleaning. Other than that, we have a motor that needs to be reinstalled, along with the gear assembly (after adding lube oil to the assembly). Total cost so far is nothing. The shop didn't charge for checking out the motor. Everything else seems to be functioning fine. We also checked the batteries water level and topped off a few that were a little low. Currently the dome can be rotated manually by hand. Suggest opening the viewing door and using the frame for mechanical leverage rather than the dome skirt. Everything else seems to be functioning fine. During the first week of January Vahan and Dave intend to reinstall the dome drive motor and gear box. Also on the agenda is to clean and lube the dome rollers and the dome gear track. If any one is interested in helping out contact Dave or Vahan.

Late Note on Star Party 26 Nov 2011

Vince and his daughter and Dave arrived at the Observatory. Dave set up his scope and Vince Used the observatory scope. Dome rotation Became a problem again so apparently we did Not get it fixed earlier. Rotated the dome Manually and observed Jupiter, Andromeda Galaxy and the crab nebula through both Scopes. Dome problem prevailed. Vince and Daughter departed. Dave stayed awhile Continuing to view deep space objects with his Scope before calling it a night. All-in-all a Reasonably good viewing night and all had a Very good time in spite of Dome rotation Problems.

Club Officers



President
Dave Covey



Treasurer
Liberty Partridge



Vice President
Vince Tobin



Newsletter Editor
Vahan Yeterian

Club Meeting

Club meeting 13 January 2012 7:00 PM

Star Parties (as always weather permitting)

14 January (Observatory around 5:00PM

21 January (Observatory around 5:30 PM)

Other Astronomy Club Meetings

Central Coast Astronomical Society

Next Club meeting 26 January 2012

Link to web site...

<http://www.centralcoastastronomy.org/>

Santa Barbara Astronomical Unit

Next club meeting 06 January 2012

Link to web site...

[http:// www.sbau.org/#AU_EVENTS_Calendar](http://www.sbau.org/#AU_EVENTS_Calendar)

Night Time Bright Objects (no scope required)

Link to "Heavens Above" web site

[http:// www.heavens-above.com/](http://www.heavens-above.com/)

(Iridium Satellite)

(ISS Visible Pass)

Be sure to set the nearest location from their pull-down menu.