

Temecula Valley Astronomer

The monthly newsletter of the Temecula Valley Astronomers

December 2014

Events:

General Meeting : No meeting in December.

**Next meeting Monday, Jan 5, 2015
at the Temecula Library, 30600
Pauba Rd, Rm. B at 7 pm.**

**For the latest on Star Parties,
check the [web page](#).**



***APOD:** The Cat's Eye Nebula from HubbleImage
Credit: NASA, ESA, HEIC, and The Hubble Heritage
Team (STScI/AURA)*

WHAT'S INSIDE THIS MONTH:

Cosmic Comments
by President Mark Baker
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by Art Cobb
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by Curtis Croulet
Art's Night Out
by Art Cobb

Send newsletter submissions to Mark DiVecchio
(markd@silogic.com) by the 20th of the month for the
next month's issue.

Like us on [Facebook](#)

General information:

Subscription to the TVA is included in the annual \$25 membership (regular members) donation (\$9 student; \$35 family).

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Cosmic Comments – December/2014 by President Mark Baker

I must admit to still being somewhat amazed (and often amused!!) at how little most people know of the skies, night or day. Now I do not profess to being an expert on where objects always are, but I do know about them and therefore can seek them out. I also cannot always recall the names of certain daytime atmospheric phenomena either, but I know of them and therefore can seek them out. I am thoroughly convinced that most people just do NOT look up, otherwise they would at least question the things before their eyes. Many of you have heard my anecdote about my neighbors curiosity regarding the “cloud” that seemed to hang over Menifee at night... but of late, I have been posting pictures detailing relative sizing of objects, such as Andromeda and the moon, 67P and the city of Los Angeles, etc. I think it’s fun if nothing else...

What I have not been prepared for is the number of people that literally scoff at such comparisons, simply because they don’t know...and the mainstream media hasn’t fed it to them!!! I so appreciate an organization, such as ours, that takes such information as we constantly share and are willing to do their own research to verify and validate what is presented. And can then extrapolate positive conclusions... such as not visually seeing the beauty of certain nebula with the naked eye, but can still accept that an enhanced image IS the same object. I’m still having discussions about M42, the Orion Nebula, and why the pictures are fake, btw...!!!

And once again, the TVA rides to the rescue, encouraging people to look up and ponder, and assimilate at least enough information to make a proper analysis, and then wonder about the Cosmos about them. Therein is where TVA truly succeeds...expanding minds and horizons. Keep up the good work...

Clear and Dark Skies, my friends...



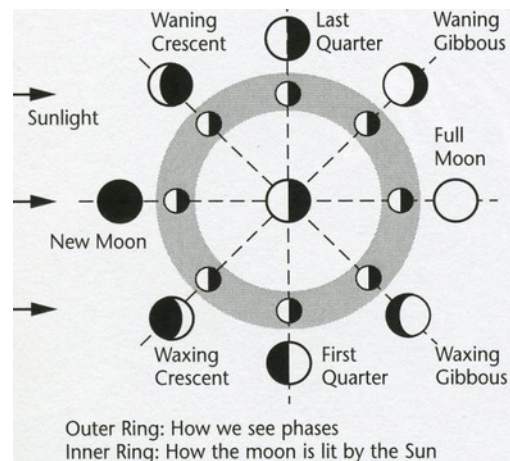
MOON Struck



Article 1

Moon watching with binoculars or a small telescope can be very rewarding. Unlike other objects in our night sky, the Moon is in season all of the time. What we do see is a varying of shape of the Moon based on its orbit around the Earth and its own orbit. Due to the speed of its rotation and speed of its rotation around the Earth, it always faces the earth at the same direction. What we do see is light and shadow changes from what we call phases; like 'new moon', 'crescent moon', or 'full moon'. Each phase of the moon will offer differences in how the various objects on the moon will look. The "crescent moon" phase will give you more shadowing along the edges of the craters and ridges. Smaller craters can be seen during the "crescent" or "quarter" moon phases. The "full moon" phase gives you more objects to view at one time, but much of the shadow detailing has been eliminated. Only during the "new moon" phase period do we have no moon to see.

Below is a diagram showing phasing and a depiction of how the moon appears to us here on Earth during these different phases.



Starting with the 'New Moon' phase, rotate counter-clockwise (or down and right) to each of the phases listed. The next in line is the 'Waxing Crescent'. Between the "New Moon" phase and the "Waxing Crescent" you will be able to see a very thin moon for a couple of days. Not much can be seen through telescopes during these couple of nights. As you look at the Moon

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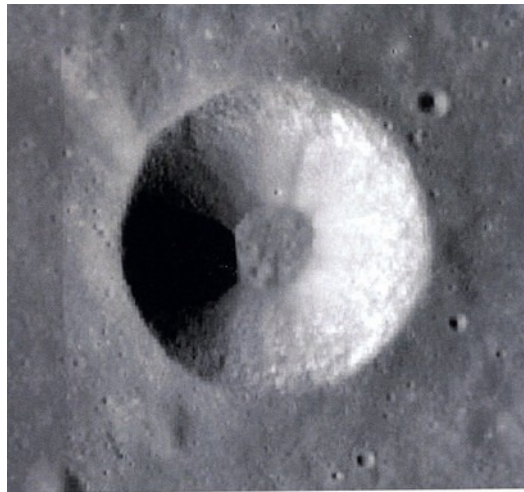
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starting at the “Waxing Crescent”, you will be able to identify more of its objects. As you move into the “First Quarter” phase, you will begin losing some of the shadowing affects. You will gain more objects to view, but will not have as much detail until you move back into the “Last Quarter” and “Waning Crescent” phases. As you observe in the “Last Quarter” and “Waning Crescent” phases, you will need to observe in the early morning hours to have the Moon visible. There is a three day period where the Moon is basically invisible; this is the “New Moon” phase.

So, what can you expect to see while observing the Moon? There are three basic types of objects we’ll be looking at: impact craters, volcanic lava flows and eruption sites, and fractures of the lunar crust. These are simply known in geological terms as impact, volcanism and tectonism.

Impact craters result from the collision of a comet or asteroid into the surface of the Moon. There are many different sizes and velocities of asteroids and comets that have impacted the surface of the Moon. Each variable will leave a different result. The least affecting impact leaves what is called a “simple crater”. These are usually small in size, with smooth inner walls and flat bottoms. See picture below.



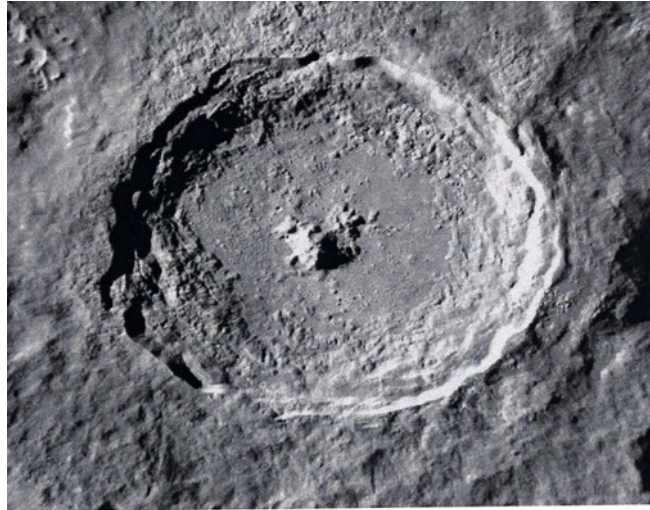
3 km wide simple crater Chladni. LRO/NASA

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More rugged and larger craters are called “Complex Craters”. These usually have jagged, sometimes multiply ridges forming rings around the center floor. The floor will usually have small cones or hills within it. See picture below.



33 km wide complex crater Tycho. LRO/NASA

Another type of crater is the “Ring Basin Crater”. These are large impact craters that have multiple rings extending out from the floor area. These are quite large and will usually display debris extending out and over the ringed walls. See picture below.



1100 km wide Multi-ringed Orientale Basin. LRO/NASA

In the next article, I’ll describe the other two main objects we can see. I will also include photographs of certain objects as viewed from my driveway in Murrieta. As I show pictures either from my photographs or others that I may use, I’ll describe the type of object and best

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times to view them. I will also include an overall "Full Moon" picture, sectioned out for ease of finding different objects.

This is the first of what I expect will be many articles concerning the Moon. If you have pictures of your own or other interesting details you'd like to share, get them to me and I'll include them in my articles. I am no expert when it comes to the various objects that can be found on the Moon. So, this will be a learning 'adventure' for me as well.

I trust you will enjoy the challenge and get out and view our Moon.

Art Cobb



Looking Up – December 2014 by Curtis Croulet

Winter Solstice occurs on the evening of Sunday, December 21, at 8:03 pm. At that time the Sun will be as far south as it can go.

Full Moon is on December 6 at 4:27 am; **Last Quarter Moon** is on December 14 at 3:51 am;

New Moon is on December 21 at 5:36 pm; and **First Quarter Moon** is on December 28 at 10:31 am.

Mercury will enter the evening sky during the final days of December. Superior conjunction is on December 8.

Venus slowly creeps into the evening sky, setting about 75 minutes after sunset by the end of December.

Mars is in eastern Sagittarius now. Through December it moves across Capricornus. Amazingly, Mars is still visible in the early evening throughout the month. It's nothing more than an ochre-colored dot in most telescopes.

Jupiter rises at exactly 10 pm on December 1 and at about 8 pm on December 31. Opposition is on February 6, 2015. The size and brilliance of Jupiter will continue to increase until then.

Saturn is now a morning object, and it'll rise about 3 hours ahead of the Sun by December's end.

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Uranus is in Pisces and **Neptune** is in Aquarius. Neptune sets a bit after 9 pm on December 31, so time is shrinking for a good view of the most distant planet – unless you count **Pluto** as a planet. That distant dirty snowball is now too low in the southwest at dusk for effective observation.

December's best meteor shower is the **Geminids**. It peaks on the nights of December 13-14 and 14-15. The Geminids is my favorite of all meteor showers. It was the first meteor shower I ever attempted to see from my childhood home in the Westchester area of Los Angeles. I toddled out of bed around 2 or 3 am, probably on the morning of Wednesday, December 14, 1955. I watched for about 15 minutes. Gemini was almost exactly overhead at that time. I saw maybe five meteors. They seemed to me to move rather slowly, and they seemed to be a bit fuzzy in appearance. This shower set my expectations for all showers to come. A meteor *shower* wouldn't be a rain of meteors, except on extraordinarily rare occasions. But I was happy with what I saw during those few moments.

Let's look up.

My previous paean for the Geminid meteors segues into my topic for this month's column. The topic is very personal, and I'll not be offended if you decide to skip it.

Sixty years ago this month, I discovered astronomy. I don't know what sparked my curiosity. We had a new public library in Westchester (Los Angeles), and I know that at some point I checked out *The Conquest of Space*, by Willy Ley and Chesley Bonestell, and *The Conquest of the Moon*, by Wernher von Braun and Fred Whipple, also illustrated by Bonestell. Maybe it was nothing more than the spectacular Bonestell paintings of hypothetical space travel that made me study those books.

I also checked out a couple of general constellation identification books, including one with pairs of pages with white stars on a blue or black background. One page had the stars with lines connecting them. The other page omitted the lines. There were pairs of pages like that for most of the bright constellations. I don't know the author or title of the book, but it led me to step outside and try to identify some stars and constellations. I was trying to make sense of the page with Andromeda, when a neighbor walked by. He pointed out Orion, which were the stars that I was trying to match up with the picture of Andromeda. At that instant, the entire sky came together. It was another year before I had a telescope, but that first year of learning the sky from star charts in popular books has put my knowledge of the sky on a solid footing in all the decades since. I think too many budding astronomers skip this step. They buy a go-to telescope (a technology unimaginable in 1954) in the belief that they don't need to know anything about the sky, but then they don't even know what's up there.

How astronomy has changed, both as a science and as an avocation! When I discovered the stars, Walter Baade was still establishing a new distance scale for the universe, using the largest telescope in the world, the then-new Hale Telescope at Palomar Observatory. Concepts such as dark energy and the accelerating expansion of the universe were decades in the future. Britain's Astronomer Royal, Sir Richard van der Riet Wooley, was about to utter

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his famous words about the prospect of space travel: “Utter bilge!” Not only have we been to the Moon since those infamous words, but we went enough times that the American public succumbed to ennui about the entire enterprise. On the other hand, some of space travel’s most enthusiastic boosters thought we would be travelling to other planets by now. Think of Stanley Kubrick’s classic film *2001 – A Space Odyssey*, which climaxes with a visit to Jupiter.

I could go on about the improvements in hardware for both professional and amateur astronomers since those days. But probably the most significant revolution has been the computer. In 1954, when I first looked up at Orion, the only computer generally known to the public was Univac, a colossal number cruncher for resolving complex mathematical equations. No one glimpsed or hinted at a future where home computers and their progeny, cell phones, would so completely dominate our lives.

I turn 70 years old on the day that I write this. I won’t live to see the revolutions in science and technology that are to come. But it’s been a wonderful ride. Please join me for a few more years of astonishment at the grand universe in which we live.

Clear skies.



Quiz Answer from the last Newsletter

When was the largest sunspot on record?

1947, called the Great Sunspot of 1947. That sunspot was three times the size of the recent AR12192 (which itself was about the size of Jupiter).

Quiz

We talk about the moon's near side and far side so we would expect that we can see 50% of the moon's surface from the Earth. But we can actually see about 59% of the surface. Why?

If you know the answer (without Googling it!) post it to <tv astronomers@googlegroups.com>.



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Art's Night Out

Article 154 December 2014

It is so hard for my simple mind to comprehend that another year is about to expire. It seems like it was just the 4th of July; yet the Christmas holiday season is upon us. I'd like to wish a very merry and wonderful Christmas, Hanukkah, Yule Tide or whatever you celebrate this time of year. May this season be filled with joy, peace and love (and a few clear nights).

This month I'd like to start out by viewing a well-known and a much viewed open cluster in our eastern sky. I am referring to the cluster Pleiades in the constellation Taurus. Pleiades is also known as M-45, one of Messier catalogued objects. In Greek mythology Pleiades is known as "The Seven Sisters". Contained in this cluster are seven prominent stars named: Alcyone, Maia, Electra, Merope, Taygete, Celaeno, and Sterope. These were daughters of Atlas and Pleione. In the current interest in viewing the night sky, some of our inquisitive sky-viewers mistake this cluster to be the "Little Dipper". As you look at this cluster, either with the naked eye or through a pair of binoculars, it does appear to look like a small "dipper" (a cup with a handle). However, the true "Little Dipper" is much to the north - east of M-45.



Pleiades dates back even into the 23rd century B.C. with writings in the Babylonian star catalogues. Pleiades is first mentioned in the Bible in the Book of Job, in chapter 9, verse 9; again in Job, chapter 38, verse 31; and in the Book of Amos, chapter 5, verse 8. The cluster was first examined telescopically by Galileo around the 1600's and was first photographed by Paul and Proper Henry in 1885. This cluster has brought viewing awe to numerous sky gazers.

This month you'll see Pleiades rising high in our eastern sky. It is very easy to recognize as it stands alone in the eastern sky. It is the only cluster of stars that is recognizable as a cluster with the naked eye. If you have the opportunity to capture this cluster on digital media, or film or CCD imagery, you may discover that these stars are surrounded by a nice blue haze. Under certain conditions, this nebulosity is very visible. I did have the opportunity to visually see this nebulosity when I was coming home one winter night from northern California. I

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stopped for the night in Frazier Park up in the Grapevine area off of Hi-way 5. Around 9 pm, I drove west of the town and found a nice, dark viewing area out in the country. Elevation in this area was around 4500 feet, there was no moon and it was a nice crisp, clear night.

I had with me my Televue 85 refractor and a swing mount. I was ready to view. As I observed the "Pleiades", I really could see a faint haze in and around the stars. I'm not sure if it was dew forming on my lens or not. I couldn't see any dew and no other objects I viewed indicated any haze. So, I'm claiming the nebulosity as my find.



Pleiades is in the constellation Taurus. Another open cluster in Taurus is the cluster Hyades. This cluster is also a large open cluster that is much more spread out in the sky than Pleiades. You can find this cluster by looking south of Pleiades and seeing what appears to be an "arrowhead", with the 'tip' of the arrowhead facing towards the south. The bright star located in the "arrowhead" is the star Aldebaran. On a clear, moonless night, this star appears to have a nice orange hue. Centered around the 'tip' star are a dozen or so visible stars that make up the open cluster Hyades or Mel 125. The stars are fairly well spread apart and cover about 5.5 degrees of sky. This is best viewed using a pair of binoculars or with a lower powered telescope. Aldebaran is not part of this group of stars.

Look northeast from Aldebaran out about 12 degrees. You will see another star called Zeta. About halfway between these two stars and down a little, you can see another open star cluster called NGC 1807. This one is a little difficult to make out, but with a little effort, you can see about 15 stars forming this cluster. One that is a little brighter and has about 25 visible stars is the cluster NGC 1647. You can see this one by looking back at Aldebaran, and then back towards Zeta the same distance that is between Aldebaran and the 'tip' star (Gamma) of the 'arrowhead'. Once at this location, look up about 1 ½ degrees. You should see this cluster.

From this cluster, look back towards Zeta at about ½ the distance between them; look up about 4 degrees. Here you should see another bright open cluster with more stars than NBC 1647. This is cluster NGC 1746. Both of these clusters are binocular visible on a moonless, clear night.

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Now, let's go back to star Zeta again. If you look north of this star about 1 degree, you can see a faint hazy disc of light. This is the "Crab Nebula" or more technically M-1. This is a faint, but fairly large object. I can see this from my driveway in Murrieta, under the right viewing conditions. It is best viewed in dark sky areas using a nebula filter. M-1 is a 'supernova remnant'. It corresponds to a bright supernova recorded by the Chinese astronomers in 1054 a.d. It was later observed by the English astronomer John Bevis in 1731; and later recorded by Charles Messier in his catalogue in 1758. Messier thought it to be a comet. It was later determined to be a nebula by Lord Rosse in 1844. The "Crab" is an often photographed and CCD imaged object. It really is a beautiful sight.



As a viewing reminder; it is always a good idea to have a pair of binoculars with you, a good star guide and lots of enthusiasm. This combination will insure you of a great observing experience (as long as you have clear skies).

Until next time, Art

