

# Temecula Valley Astronomer

The monthly newsletter of the Temecula Valley Astronomers

February 2015

## Events:

**General Meeting : Monday, Feb 2, 2015 at the Temecula Library, 30600 Pauba Rd, Rm. B at 7 pm.**

We will have our usual What's Up by Tim Deardorff and a presentation by Sam Pitts titled "An Amateur's Adventure into Astronomy". More details on the next page.

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



[Hubble 25th Anniversary: Pillars of Creation](#) – Credit NASA, ESA & STScI

## WHAT'S INSIDE THIS MONTH:

### Cosmic Comments

by President Mark Baker

### Stellar Outreach Award

by Paul Kreitz

### MOON Struck – Article 3

by Art Cobb

### Looking Up

by Curtis Croulet

### Ooops

### Art's Night Out

by Art Cobb

Send newsletter submissions to Mark DiVecchio ([markd@silogic.com](mailto:markd@silogic.com)) by the 20<sup>th</sup> 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 – February/2015

by President Mark Baker

I had the opportunity at the January meeting to discuss the history of identifying and tracking Near Earth Objects (NEO's), and Potentially Hazardous Objects (PHO's) in particular. We have come a long way in understanding their nature and erratic behavior, but are just now getting to the true understanding of how one loose "rock" can ruin your whole day!!

And maybe it's just me, but since I gave that presentation, I seem to be hearing more on the subject than ever... toss in Comet Lovejoy and the dialog on the subject is not only extensive, but worldwide in scope!!

And now we have the Dawn Probe nearing the largest of them all (and earliest discovery), Ceres, and we stand to learn so much more on what makes our Solar system tick.

And in a sense, this is why I am so anxious to get our observatory complex up and running... so we can participate in adding to the knowledge of our cosmos if we so choose. But what fun it'd be to have a Comet Kreitz or Asteroid Anderson come about because we were diligent in our observations... what fun indeed!!!

So again, here's to what we do and to what we'll be able to do...for our science, our communities, and for each other!!

Clear and Dark Skies, my friends...



## More on our February Speaker

Sam Pitts, a recently transplanted Oregonian, will present "**An Amateur's Adventure into Astronomy**".

The program gives a very brief time-line of modern astronomical accomplishments. Discusses briefly how telescopes work and what is available to amateur astronomers. Next a brief discussion on how we see light and the basic tools employed by amateur astronomers: visual, photographic and digital. We then take a photographic tour of the night skies, starting with atmospheric phenomenon, solar system objects, the Milky Way and what lies beyond. The images follow a rough chronological order based on the object's distance from earth.

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## Stellar Outreach Award

*Each person who applies for the Astronomical League's Outreach Award at the Stellar level has to submit a report on one of the Star Parties hosted. As our members apply for this award, the Temecula Valley Astronomer will be publishing those reports. Here is the first:*

**Activity:** McElhinney Middle School Astronomy Clubs Support  
**Date:** October 30, 2014  
**AL Member:** Paul Kreitz

For several years Temecula Valley Astronomers (TVA) has provided support for the Astronomy Club at McElhinney Middle School in Murrieta, CA. Two years ago I volunteered to assist the primary TVA representative, John Garrett. Since then John and I have essentially taken turns in leading the monthly meeting of the Astronomy Club. Club meetings are held during the lunch periods at the school. The general format is a PowerPoint presentation to the club members on an astronomical topic chosen by the presenter, with hopefully time for discussion both during and after the presentation. In the 2013 – 2014 school year McElhinney had a separate lunch period for 6<sup>th</sup>, 7<sup>th</sup>, and 8<sup>th</sup> grades, and therefore three separate Astronomy Clubs. This year they consolidated two classes, so there are two Astronomy Clubs.

For the October meeting, held on Thursday, 10/30/2014, I chose a topic of “Rosetta: chasing a Comet”. It seemed particularly apropos as the meetings were held less than 2 weeks prior to the scheduled landing of the Philae Lander on Comet 67p on Wednesday morning (PST) November 12th. I wanted the members to be aware of what was happening, the significance and difficulty of the landing, and the potential knowledge to be gained as Rosetta, Philae, and Comet 67p continue their approach towards the Sun and then recede away from the Sun.

For the program I first cannibalized parts of a previous program I had done for TVA on the topic of “Comets, Meteors, and Other Erratic Night Sky Phenomena” dealing with describing the nature of comets, so that the members could understand what Rosetta is chasing. I then added detailed information about Comet 67p and the Rosetta mission, including several videos from both the European Space Agency and NASA, describing the convoluted path Rosetta has taken to intercept Comet 67p, the perils of dropping the lander onto the desired point on the comet nucleus, and a summary of what we hope to learn.

There were 24 attendees at one of the meetings, and 26 at the other. I feel quite confident that most of those students will check to see how successful the landing was on Wednesday morning, and will be able to explain to their friends why it is a cool thing if the landing is a success or a bummer if it fails.

**Postscript:** The above report was submitted to the Astronomical League, as a part of the qualification for the “Stellar” Outreach Award, on October 30<sup>th</sup>, 2014, prior to the landing of Philae on Comet 67P. At a subsequent meeting in November I did confirm that many of the Club members had, in fact, checked on the success of the landing. It gave us a good opportunity to discuss the degree of success or failure of the operation.

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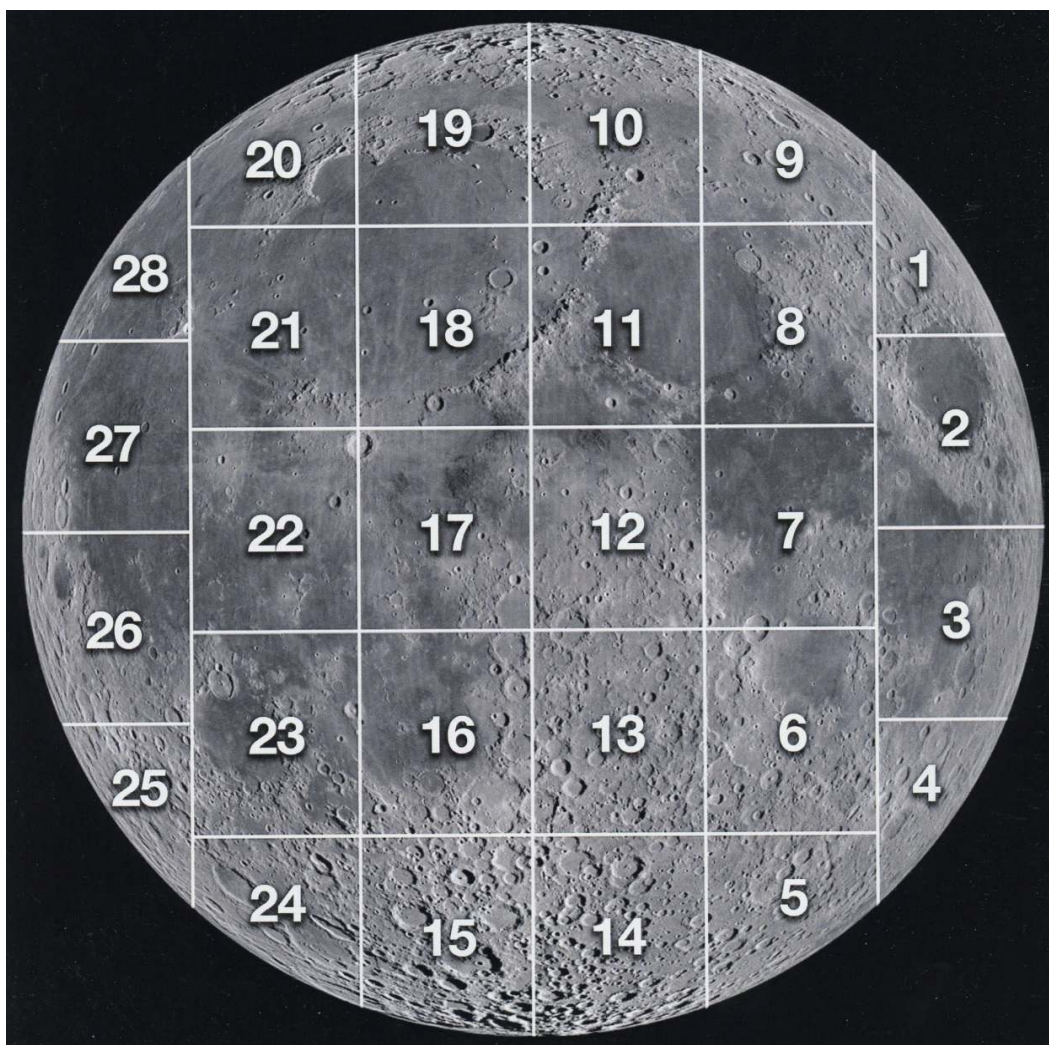
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## MOON Struck



### Article 3

Once again I'd like for us to find and identify a few objects on our moon. I will utilize the "Index Map" as before, as well as a photograph that I had taken. I'll also include a few of the Lunar Reconnaissance Orbiter (LRO) from NASA Lunar mission, as I did before.



INDEX MAP



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If you look at the Index Map and my photograph below, you'll notice a 30 degree rotation between the two. My photograph shows an approximate rotation counterclockwise of 30 degrees. I presume that the difference is due to the latitude of my location on Earth and the axis rotation of the Moon.



## ART'S PHOTOGRAPH

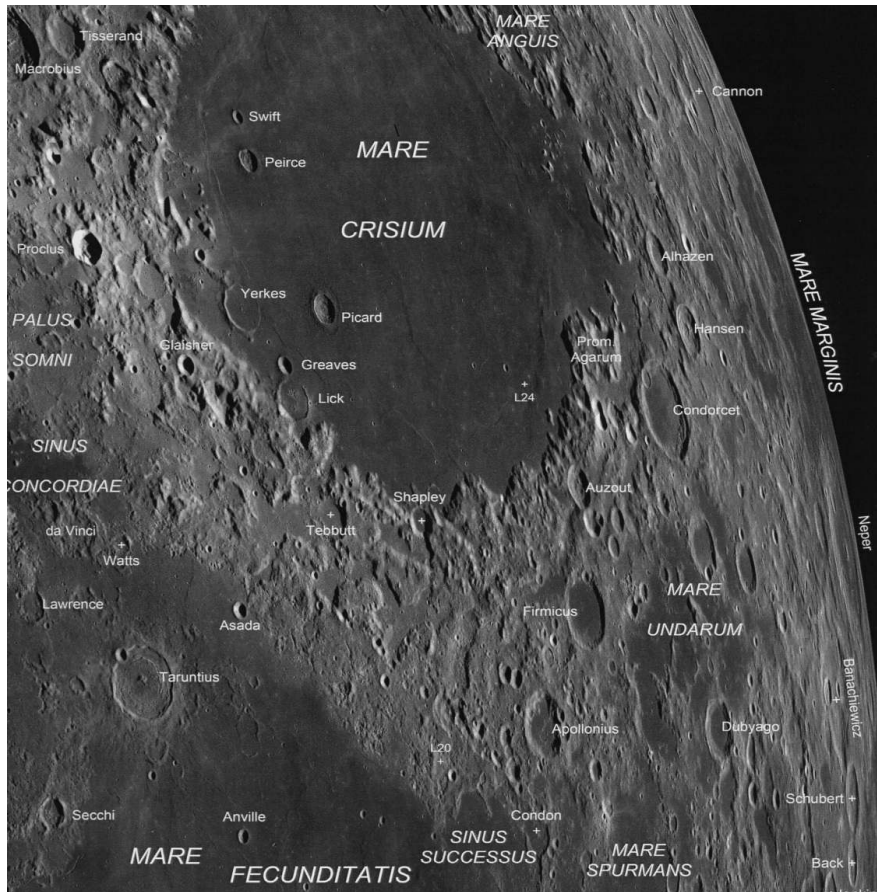
Canon 5Ti – Prime Focus through 6" Celestron Cassegrain

First, look at the Index Map and locate section #2. In the top area of this section is a large, well defined "mare" or "sea". As mentioned before, mares are large, flat areas that have been created by lava flow. These areas appear as dark basins to us here on Earth. This 'mare' is called **Mare Crisium**. In my photograph, this mare is almost to the top of the Moon and is a nice, well defined circle. There are a couple of things I wish to point out in this mare. I am including a LRO picture of this section for comparison.

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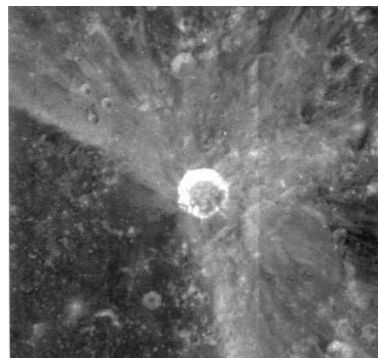
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## Section 2 LRO Picture

If you look at my photograph, you can see a small bright spot on the lower side of the mare. It is actually in the 'rim' area around on the lower side of the mare. In the LRO picture, this is the small crater to the left of the Mare Crisium. In my photograph you can see this bright spot and its bright "rays" that project outward. These rays are formed from projectile that is thrown outward upon the impact from a meteor or large asteroid. This crater is called Proclus. I have included a picture of this crater taken again by the LRO mission.



**Proclus** (A3, 27 km): Brilliant walled oblique impact crater indicated by zone of avoidance ray pattern defining Palus Somni (Chart 8). Clementine.

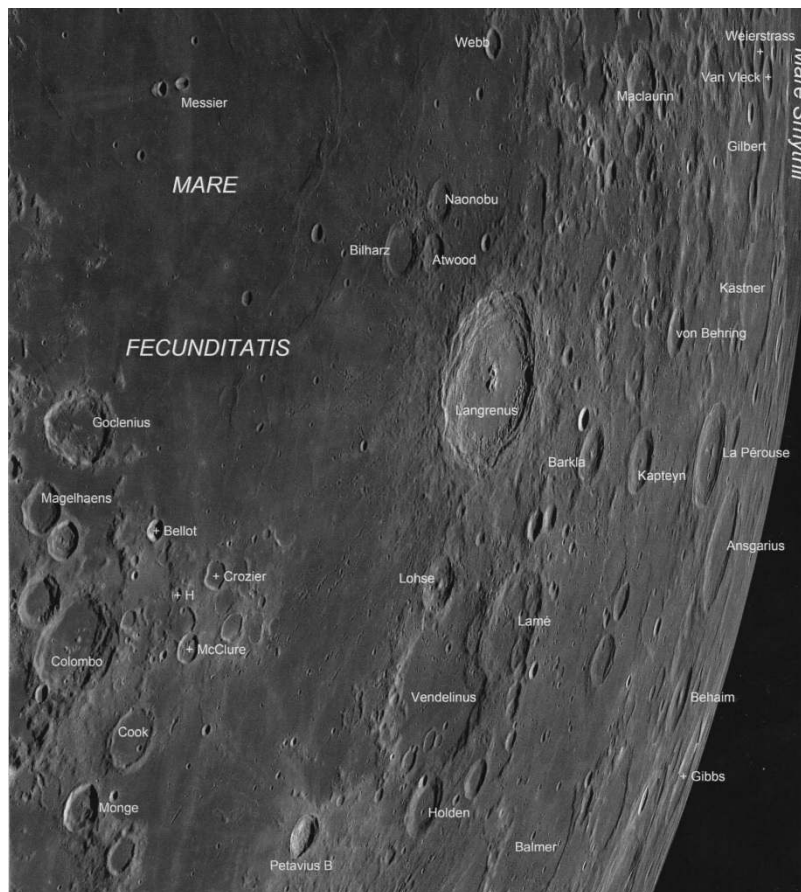
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Look at the LRO picture, section 2, again. Just to the right of the Crater Proclus you can see a small mountain or ridge area, just inside of the mare. There is an elongated bright mountain ridge; then down from that is a small crater, connecting into a long narrow ridge. This ridge is called a 'rille' and believed to be a fracture in the moon's surface. There are several fractures throughout many of the 'mares' on the moon. If you look at my photograph, you can see the bright area of the small mountain, just not the 'rille'.

Look now at section #3 on our Index Map. Once again find this on my photograph. I am including the LRO picture for comparison. We are looking at Mare Fecunditatis area, which is in the upper left area in the LRO picture. Just about in the center of the LRO picture you can see a nice complex crater called "**Langrenus**". Looking at this crater in my photograph, you'll notice that it appears to be a little brighter than the surrounding area. We are seeing this due to the sun's location and reflection off of its rim walls. I thought this was cool in my photograph.



## SECTION #3 LRO Picture

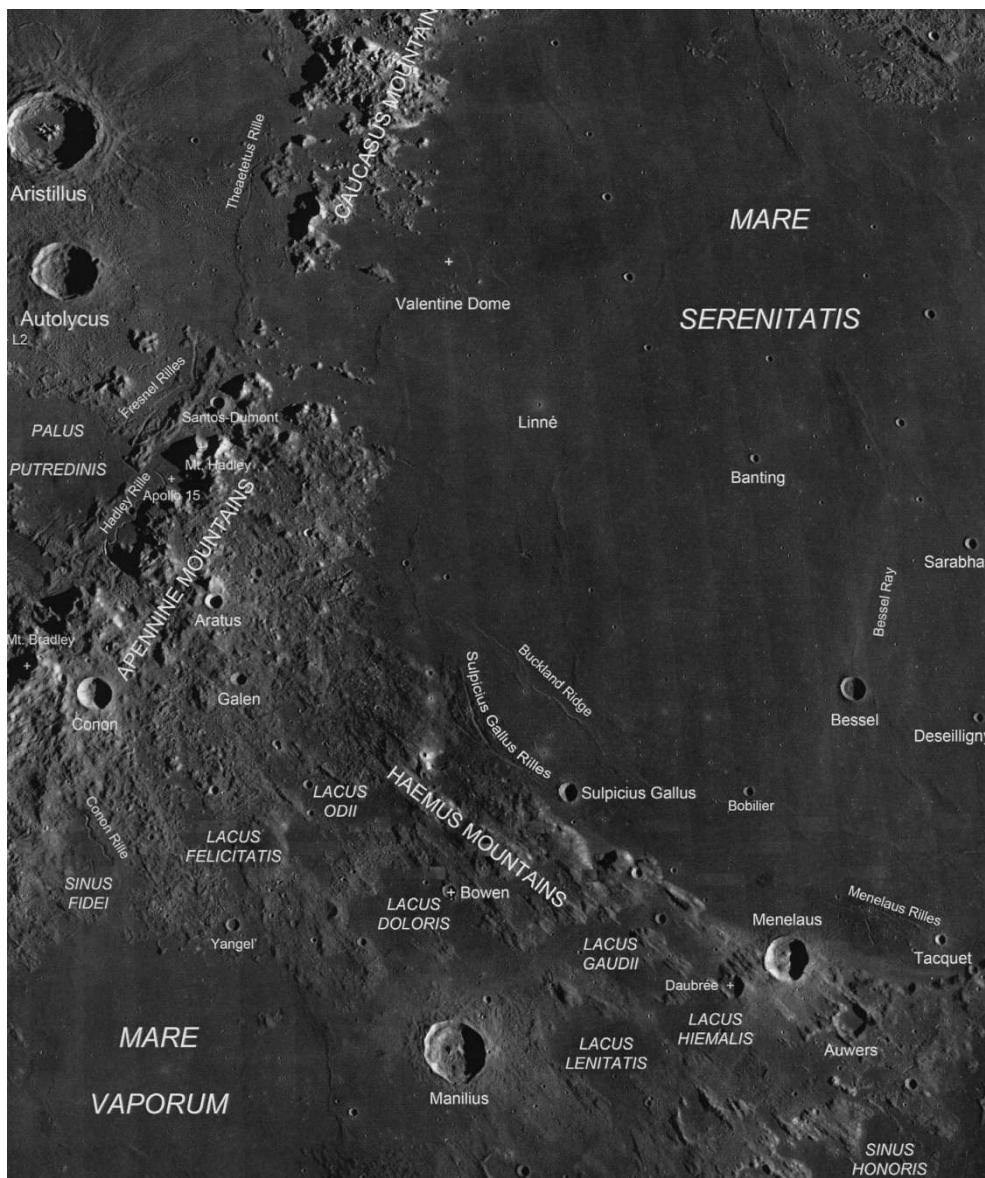
Now go to section #11 in the Index Map. Also, locate this area in my photograph. We are in the area mostly of Mare Serenitatis again and just entering into the area of Mare Imbrium. Separating these two mare areas are two nice mountain ranges that are visible in telescopes and are quite nicely photographed by the LRO project. I have included the LRO photo below.

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My photograph will give you a dim outline of these two ranges, but not show you much detail. The lower range is called Apennine Mountains. These are commonly called the “Alps” of the Moon. Just above this range of mountains is the other range called “Caucasus Mountains”. They are both separated by a smooth mare area that is connecting the Mare Imbrium to the Mare Serenitatis.



## SECTION #11 LRO Picture

If you look at my photograph, you will see two bright craters at the lower side of the Apennine Mountains. The upper small crater is called “**Conan**” and is seen in the LRO picture for section #11.

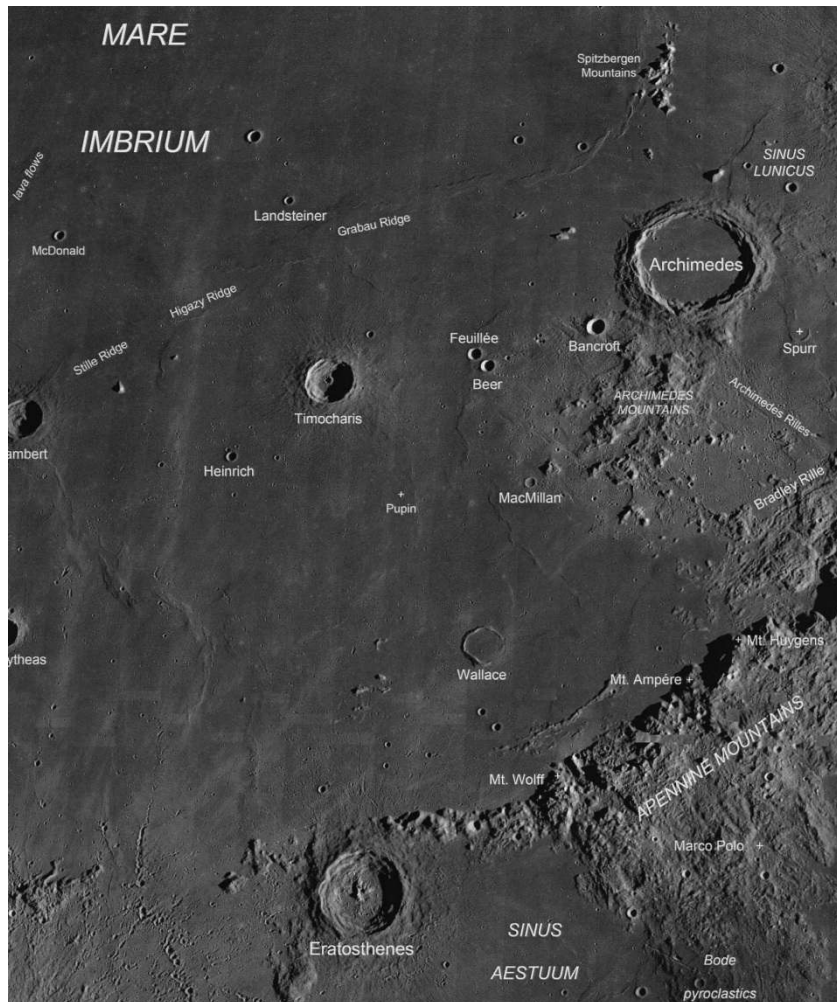


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The larger crater below Conan is seen in the LRO picture for section #18, which I've included below. This crater is called "**Eratosthenes**". It's interesting how the position of the Sun gives us different looks on the Moon. This is why it is important to view the same objects at different times of the Lunar cycle.



**SECTION #18 LRO Picture**

Hope you enjoyed this session of **MOON Struck**.

Art



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## Looking Up – February 2015

by Curtis Croulet

**Full Moon** is on February 3 at 3:09 pm; **Last Quarter Moon** is on February 11 at 7:50 am; **New Moon** is on February 18 at 3:47 am; and **First Quarter Moon** is on February 25 at 9:48 am.

**Venus** and **Mars** are both early evening objects. The gods of love and war will almost meet in a close conjunction on February 21. They will be only 0.4 degrees apart, and you may need a telescope or binoculars to split them. By then they'll be in Pisces. **Venus**, having spent several weeks mired in the early twilight, has suddenly vaulted much higher into the evening sky.

**Mercury** had a fine near-conjunction with Venus in January. It'll subside to the sunset horizon by the end of January. Then it'll head into the morning sky, becoming visible in late February and reaching greatest elongation by February 24. This will not be a particularly good morning apparition, however. Better morning apparitions come in June and October. A fine evening apparition comes in May.

**Neptune** is in Aquarius, and it'll be too far west for easy viewing. **Uranus**, now in Pisces, won't be much easier. But **Uranus** is much brighter than **Neptune**.

**Jupiter** reaches opposition is on February 6. **Jupiter** is in westernmost Leo, but it's in retrograde motion. It'll creep westward, re-entering Cancer around February 9. **Jupiter** will remain in Cancer until early June. Jupiter is a magnitude -2.5.

**Saturn** rises around 2 am on February 1 and shortly after midnight at the end of the month. Opposition is on the night of May 22. **Saturn** is in northern Scorpius.

If you're very determined to see **Pluto**, you can try just before dawn at the end of February. I know some of you have been observing **Comet Lovejoy C/2014 Q2**. As I write this (January 19), it's in Aries, very high in the evening sky. But it's moving northwestward very rapidly. It's magnitude 4.4 at latest report, which is about as bright as it's going to get. When I looked at it with my 8-inch reflector at 50x, it was bright, and the tail was distinctly visible. Try giant binoculars. There's a good chart on *Sky & Telescope's* website on the Observing page.

Let's look up.

Viewing opportunities have been erratic lately. The really frustrating nights are those when the Santa Ana winds are blowing. Santa Ana winds are dry winds from the northeast. Such nights are sparkingly clear, with little light scattering, but they invariably suffer from poor "seeing." "Seeing" isn't the same thing as darkness or transparency. "Seeing" is the steadiness of the air. I think the term originated during the 19<sup>th</sup> Century, when the crop of large refractors from famous makers such as Brashear and Clark encouraged astronomers to study the planets.

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For planet observing, steady skies are mandatory for viewing fine detail. A bit of mist or haze is actually an advantage, since it indicates steady air.

If you see a forecast of Santa Ana winds, then you know you're in for a night of poor seeing. You might enjoy low-power views of galaxies, but planets will look like fuzzy blobs at the bottom of a pool. That's bad seeing. On the other hand, when we have an onshore flow, with light winds coming off the ocean, then seeing will be good – provided the onshore flow isn't so deep and strong as to bring in marine stratus (the "marine layer"). Years ago, when I lived in San Diego, I almost always had good seeing, because the Santa Ana winds were rarely significant.

During the nineteen years I lived in Temecula, conditions were less predictable. The onshore flow, which in San Diego gave me good seeing, often gave me poor seeing early in the evening. My hypothesis is that the air actually tumbled over the Santa Ana Mountains, which are immediately west of Temecula (and Murrieta, Wildomar, and Lake Elsinore), causing turbulence. Later at night things would steady out, and seeing was often excellent. Here in Anza, Santa Ana winds are often ferocious, and seeing at such times is correspondingly bad. But the night that I write this, January 19, is to die for, with razor-sharp seeing.

These thoughts came to mind tonight as I looked at a variety of objects with my 8-inch reflector, preparing for my originally-intended topic for this column. Jupiter was tack-sharp. Rigel, Adhara, and Castor were easily split. I *still* couldn't see Sirius B, the "Pup." I'll keep trying.

My intended topic was Gemini. Gemini often seems to be overlooked, what with Orion in the area. There are two bright stars in Gemini: Castor and Pollux. If you can imagine the Gemini brothers standing side-by-side, Pollux is the brother on the left, Castor the brother on the right. Or, considered another way, Castor is west of Pollux. Castor is the first to rise. Although we often think of these stars as a pair, Pollux is in fact the brighter of the two, being magnitude 1.16, seventeenth brightest star in the sky. Castor isn't even the brightest mag 2 star in the sky. It's only mag 1.58, while Adhara (the rear leg of Canis Major) is 1.50. The odd thing here is that we almost always refer to the Gemini twins as "Castor and Pollux," as though Castor were the brighter of the two.

Castor is seen as a binary star in our telescopes. These components are about 5 arc seconds apart and are an easy split in most amateur telescopes. But each component is itself a spectroscopic binary (detectable only by spectroscopy). And Castor has another faint component about 72 arc seconds away from the stars we see, and that component is also a spectroscopic binary. Thus, Castor is a six-star system.

Gemini is home to one of the sky's easiest and most beautiful open star clusters, M35, located on the western side of the constellation. M35 is an easy binocular object. Gemini also hosts a small but bright planetary nebula, NGC 2392, located east of Delta Geminorum, also called Wasat. NGC 2392 is sometimes called the Eskimo Nebula. It looks a bit like a man's face with a large furry ruff around it. In our telescopes, it's a bluish-green spot of fuzz. But a couple of years ago I got to view it through the 4.3m Discovery Channel Telescope, near Flagstaff, AZ,

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and the nebula really looked like the “Eskimo nebula” photos. Don’t ignore Gemini when you’re looking at the winter sky.

Clear skies.



## Ooops

I shouldn't be pointing this out.....

Astronomers are known for their observational skills. They are the sharp eyed sleuths of the cosmos. But I wonder.... As editor of the Temecula Valley Astronomer, I attempt to find all the little glitches and typos before they make it into the newsletter. I can say now with certainty that one got by me. As a matter of fact, It got by me on every newsletter since I started my editorial career last summer.

So while I am bowing my head in shame, I will pose the question to our readers. Can you find the mistake that has occurred in every newsletter since last summer (but is corrected in this issue) ?



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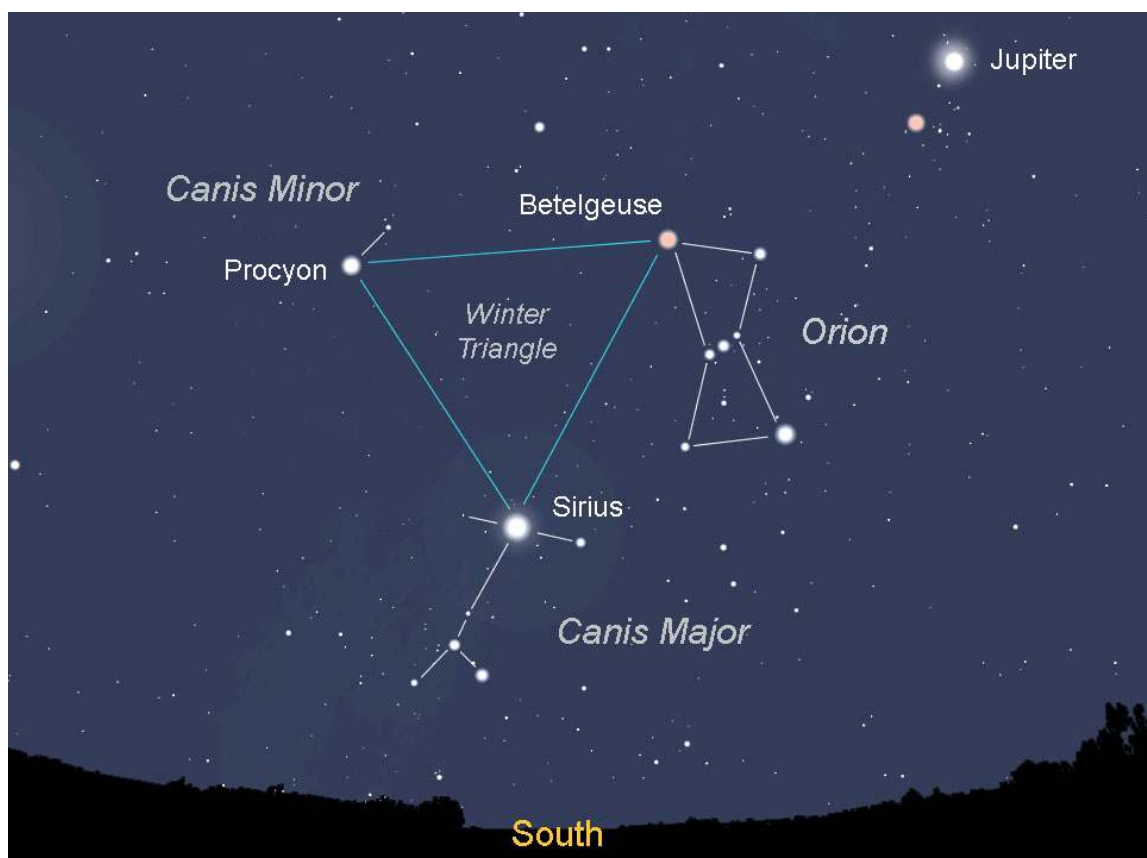
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## Art's Night Out

### Article 156 February 2015

I'd like to have us start by finding the "Winter Triangle". This is a triangle made by three bright stars in our southern sky. We looked at the constellation Gemini last month. Just below the Constellation Gemini is the constellation Canis Minor (the Small Dog). This constellation is identified by two stars. The brightest star about 15 degrees below Gemini is Procyon. Below Procyon and to the right is the brightest star in our southern sky and that star is Sirius, in the Constellation Canis Major. Up and to the right of Sirius you'll see the Constellation Orion. The star that forms a triangle with Sirius and Procyon is Betelgeuse. Betelgeuse is the upper left shoulder star in Orion and is orange in color. As you look at these three stars, you have your Winter Triangle.



(Not proper location of Jupiter)

Do you have a pair of binoculars with you? You should know by now that I do recommend that you bring along with you a pair of binoculars any time you go viewing with your telescope. While you are looking at the Winter Triangle, I'll have you view the infamous Orion Nebula. I won't spend much time in Orion, as I have covered most of the nebulae and clusters before. However, we just can't move on in our viewing until we again look at the Orion Nebula. As you look at Betelgeuse, you will need to look to the right and down of that star. The Constellation



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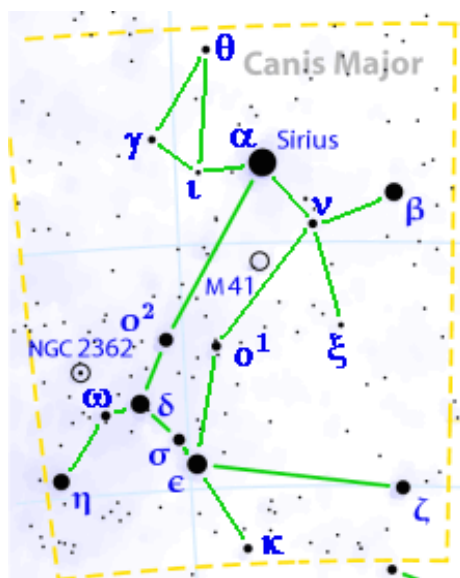
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Orion is identified by the shape of Orion the Hunter. You will see four bright stars forming his two shoulders and two feet. These four stars are in the shape of a large rectangle.

In the middle of this rectangle are three stars forming the 'belt' of Orion. If you look below the 'belt' stars, you'll see a line of stars forming Orion's 'sword'. If you have your binoculars, look right in the middle of his sword. You will notice a nice hazy area around some of the stars in the sword. As you look at this area with a telescope, the haze develops into a nice bird shape that fills most of your eye piece. Like most nebulae, the darker the skies, the more of the nebulosity or 'haze' you can see. This is certainly true with Orion Nebula. This nebula is easily seen in our light-polluted Temecula/Murrieta Valley skies. Another great viewing aid is a good nebula filter. There are a few on the market that are available. I use the O-III filter. A quick test as to the quality of the optics in your telescope is by viewing the four stars in the middle of the nebula. As you observe the middle area of the nebula, you should see four stars. At low power, these stars may look like one or two large stars, slightly out-of-focus. As you increase in your power, four stars should emerge out of the two brighter stars. The challenge is to see these four stars as pin-points. The sharper the pin-point look, the finer your optics are. As you move around the area of the 'sword', you will notice a few really nice 'open star' clusters. Take some time and enjoy your view.

The next segment of viewing will be best accomplished away from our city lights. The next area of viewing is just below and left of the Constellation Orion. The star Sirius is actually a part of this constellation. I'm referring to Canis Major, the "Big Dog".



There are several open star clusters that are visible in and near this constellation. I usually try to get up into the Santa Rosa Plateau on a moonless, fairly clear night. Eastern Temecula Wine Country or even Anza would be other good areas to view in. Look at star Sirius again. This star forms the shoulder star of the "Dog". Down and left of Sirius you'll see four main stars forming its body. To the right of Sirius you'll see two stars forming its two front legs. The

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two stars to the far left of Sirius are the two forming its hind end. To the left of the upper hind star is another star forming its tail. Down and to the right of the lower hind star, you'll see stars forming its two hind legs. Up from Sirius are three stars in a triangle shape forming its head. You will want to view our next objects with low power; 35 to 45 power would be good.

Look at Sirius. Now look up to the 'nose' star of the head; this star Theta.

Form a line from Sirius up through Theta out about the same distance as between Sirius and Theta. In this area is a nice open star cluster called M-50. This has approximately 100 visible stars. It is fairly open and easily recognized as a star cluster.

Look at Sirius. Now look at the upper 'hind end' star, Delta. Look north or left of Sirius, forming a triangle with star Delta. In this area where a triangle could be formed with Sirius and Delta are two more open star clusters. As you look at Sirius and out left, you'll see another visible star, Gamma. Use Gamma as a guide star allowing you to form a line from Sirius out past Gamma to the point where your triangle is made. At that point, you should see open cluster M-47. This cluster is brighter than M-50, but has fewer stars in the cluster and they are scattered out more. However, this is still a fairly recognizable cluster in darker skies.

Just to the east of M-47 is another open star cluster called M-46. M-46 is a little smaller than M-50 and is not as bright. This one does take the darker sky to the nice oval shape of the cluster of stars.

Locate the 'tip-of-the-tail' star, and the top 'hind-end' star, Delta. Notice the distance between these two stars. Look out east again about twice the distance that you measured between the two stars and form a triangle point with the two stars. In this area is another open star cluster called M-93. This cluster is about the same size as M-50, but appears brighter. There aren't as many visible stars, but they have a nice sparkle to them.

Next, locate the two stars facing west that form the belly of the dog. If you start with the star that is below star Sirius and look towards the lower 'hind-end' star about four degrees and left or east slightly, you can see another open star cluster called M-41. This one is actually visible with the naked eye in dark sky locations. It is easily seen using your telescope. It is about the same size as M-47, just brighter.

With all of these open star clusters, in the viewing conditions I've described, you can use a pair of binoculars to help locate them.

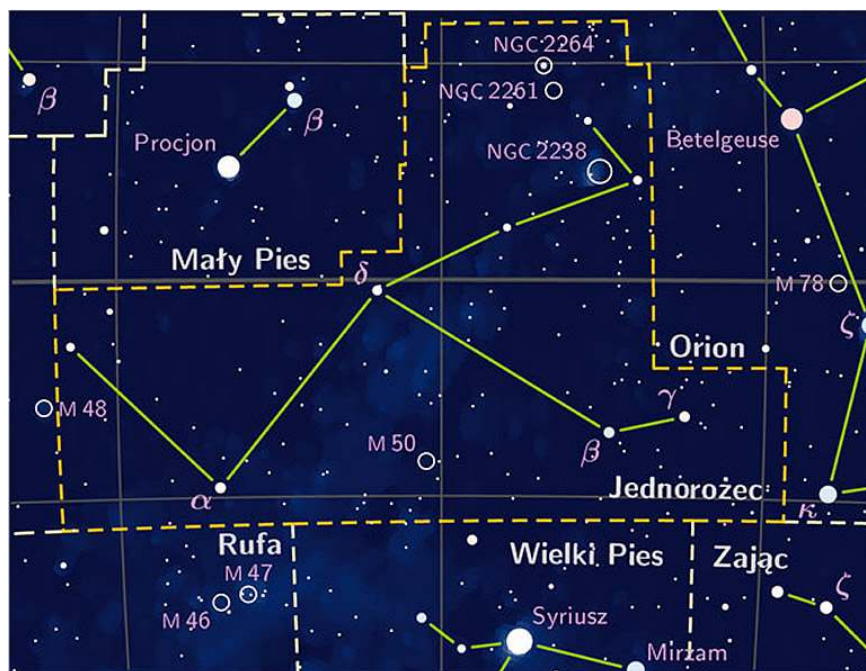
For our last viewing tonight, look back at the Constellation Orion again. Find Betelgeuse (the orange star in the upper left area). To the east or left of Orion is the Constellation Monoceros (The Unicorn). This Constellation is made up of several stars, mainly visible in darker skies. I have a hard time seeing what I need to see from my driveway in Murrieta. You should be in dark sky areas like eastern Temecula Valley or Anza. Just left of Betelgeuse about 5 to 8 degrees will be the head stars of The Unicorn. You can see a group of stars forming an elongated triangle with the single point star facing Orion and the two back-of-the-head stars facing the Constellation Gemini (which is up and left of Orion). If you form a line from the star Procyon in Canis Minor to Betelgeuse in Orion, this line will intersect the 'head' of the Unicorn.

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If you look below this point of intersection, about 2 to 3 degrees, you will be able to see a small open star cluster surrounded by a fairly large, faint ring of haze. This ring of haze is known as the “Rosette Nebula”, NGC 2237. The ‘Rosette Nebula’ is seen in binoculars in dark skies, but is better viewed using your telescope at low power. Once again the best viewing will be with a nebula filter.



I think I've given you enough to enjoy for this viewing.

Until next time, Art