Temecula Valley Astronomer

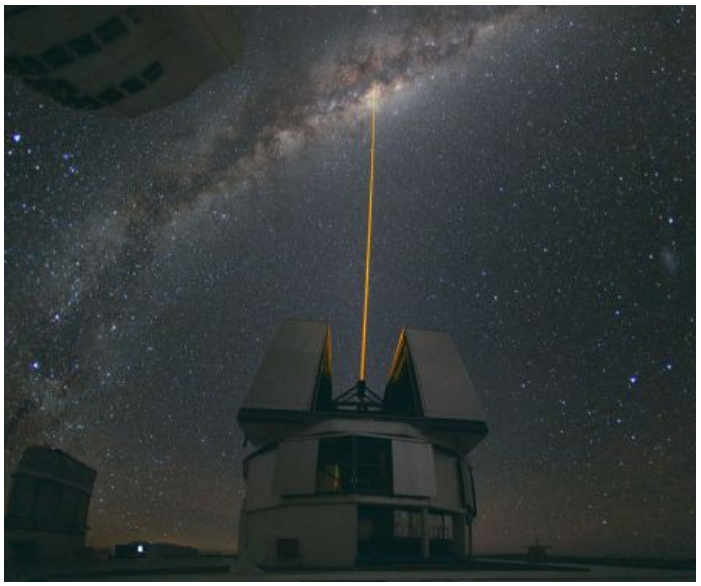
The monthly newsletter of the Temecula Valley Astronomers March 2015

Events:

General Meeting : Monday, March 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 John Garrett will tell us about how telescopes work (and you think you know! Ha!). His talk is titled "An unusual fascination with pinhole projections, and other analogies from my time in prism".

For the latest on Star Parties, check the web page.



APOD - A Laser Strike at the Galactic Center - Image Credit: Yuri Beletsky (ESO)

WHAT'S INSIDE THIS MONTH:

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

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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 – March/2015
by President Mark Baker

I have to admit that I am out of step with a lot of the technologies currently available to the amateur astronomer… nowhere is this more evidenced that trying to set up and use the newest donation to our Club. The 8" LX200 Meade has all kinds of bells and whistles including GPS, self leveling, and Home finder…and as I struggled to get it setup and to track properly I wonder how much of my problems are directly attributable to the technology… or just plainly my ignorance!!!

I can now better relate to anyone who picks up a new "toy" or "tool" and just can't get it to work right at first. Makes me glad to know I am surrounded by so many experts whose experience and knowledge are available to tap into… so if you get a call from me, be forewarned that I may just be looking for some advice or a calming influence before I kick the darn thing!!!!

Thanks for being there, not just for my benefit, but for any who may need help in opening up the cosmos so as to wonder and ponder…

Clear and Dark Skies, my friends…

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.

Star Party - Tour de Stars
Mark DiVecchio
10 Nov 2014

Many of the star parties that I've done recently have been at schools or other community venues. When you do a star party like that with 100 to 200 people and multiple scopes, its hard to tell a story. Each person gets only a minute or two at the eyepiece so you have to show them something they understand quickly and that might be a view they will remember.

The other kind of star party is one for 10-20 people. At this kind of star party, I can tell a story. I can tell a story about a particular type of object or even a specific object. What I really like to

do is tell a story about the immensity of space. Our day-to-day experience of distance is measured in miles. I try to help my audience understand the distances involved in space.

I usually do these small group star parties in the summer. I ask my audience to meet before dusk at our viewing site. The site I like is about 20 miles outside of town. Far enough for reasonably dark skies but close enough not to scare off anyone off. The best time is 3-6 days after a new moon and with luck, at least one planet will be up.

As the sun sets, I try to point out the first stars visible - usually the summer triangle. I talk about constellations and asterisms.

Once the sky is dark, our first targets are man-made satellites. Many web sites and cell phone apps help you find what is visible. While we are waiting for them to come into view, I talk about how far away they are. First I talk in miles, about 200, then I introduce the concept of the speed of light. I ask how long it takes for light to travel 1 foot (about 1 billionth of a second), then how long to travel 1 mile (about 5 millionths of a second). Then I switch to asking how far does light travel in one minute (about 11 million miles), one day (about 16 billion miles), one year (about 6 trillion miles).

So, I ask, how far away is that satellite in light distance? About 1 light-millisecond.

Before the moon sets, I aim the telescope there. After letting everyone take a look, I ask how far away is the Moon? If I have to give a hint, I use the easily remembered approximation of a quarter of a million miles. How far in light distance? - about 1¼ light-seconds.

Then a planet - I pick whichever one is up. I always hope for Jupiter or Saturn. Saturn for example, might be 880 million miles or about 80 light-minutes away.

I talk about the nearest star (which we can't see from our star party location). I point out that Proxima Centauri is about 24 trillion miles away or about 4 light-years.

I return to the summer triangle and point out Altair, Vega and Deneb at 16.5, 25, and 1,500 light-years distant.

I show them some stars in the telescope and explain that looking at a typical star is not very exciting. They look like points of light. I explain why.

Then I move the scope to a planetary nebula. M57, the Ring Nebula, for example, is 2,200 light-years away.

On to M13, the Great Globular Cluster in Hercules, which is 22,200 light-years away.

On to the center of the Galaxy, 30,000 light-years away. I point out about where the center is and why we really can't see it.

On to M31, the Andromeda Galaxy 2,500,000 light-years away.

We have then reached the end of our story. This kind of star party lasts about 4-5 hours. It gives everyone many opportunities to look through the telescope at many different kinds of objects. It lets the members of the audience talk with each other and I try to drop in little tidbits of information without overloading.

This past summer marked the 24th year that I've done this. Whew!

Summary:

Object	Miles Distant	Light Years Distant
Satellites	200	0.0000000000
Moon	250,000	0.0000000417
Saturn	880,000,000	0.0001466667
Altair	99,000,000,000,000	16.5000000000
Vega	150,000,000,000,000	25.0000000000
Deneb	9,000,000,000,000,000	1,500.0000000000
M57	13,200,000,000,000,000	2,200.0000000000
M13	90,000,000,000,000,000	15,000.0000000000
Center of Milky Way Galaxy	133,200,000,000,000,000	22,200.0000000000
Andromeda Galaxy	15,000,000,000,000,000,000	2,500,000.0000000000

Looking Up – March 2015
by Curtis Croulet

The **Vernal Equinox** occurs at 3:45 pm, Friday, March 20.

The annual silliness of **Daylight Saving Time** begins on Sunday, March 8. You'll advance your clocks one hour ("spring forward; fall back").

Full Moon is March 5 at 10:05 am; **Last Quarter Moon** is March 13 at 10:48 am; **New Moon** is March 20 at 2:36 am; and **First Quarter Moon** is March 27 at 12:43 am.

Mercury will be visible low in the morning sky during the first part of March. Better morning apparitions come in June and October. A fine evening apparition comes in May.

Venus dominates the evening sky, and it'll become higher and brighter. Greatest elongation (angular distance east of the Sun) occurs on June 6. March 4 brings an interesting conjunction of **Venus** and **Uranus**. You can get an interesting

view of the two planets in the same low-power field on the evening of March 4, but that'll be after their closest approach, which occurs around 10:40 am. Venus should be easy to see in the daylight sky in a scope, although *finding* can be a problem. An accurately calibrated go-to scope makes it easy, however. **Uranus**, which will be about 10,000 times fainter than Venus, will probably be impossible to see in a scope during the closest approach.

Mars is sinking into the dusk twilight. It's tiny and not particularly bright (mag 1.3). Mars's next opposition is May 22, 2016.

On the other hand, **Jupiter** is at its best for evening viewing. The giant planet is visible all night. It's in Cancer, and it's in retrograde motion. That is, it's moving "backwards" in the sky. Retrograde motion will continue until about April 7, at which time Jupiter will resume its normal eastward motion.

Saturn is in Scorpius, north of Antares. The ringed planet rises shortly after midnight on March 1 and shortly after 11 pm on March 31.

Uranus is in Pisces in the western sky at sunset. See the write-up about **Venus** for info about the close conjunction on March 4.

Neptune experienced conjunction with the Sun on February 26. It's too close to the Sun for viewing.
A very determined early riser might be able to find **Pluto** just before the dawn sky starts to brighten. The dwarf planet is in Sagittarius.

Let's look up.

February and March evenings are particularly good times to view the evening **zodiacal light**. This is naked-eye astronomy. No telescope is necessary. You'll need a decently dark sky and a clear western horizon. Zodiacal light appears as a huge, delicately glowing wedge of light extending up from where the Sun has set. It might be mistaken for lingering twilight by the casual observer. But if you look carefully, you can see that the sky is darker on each side of the wedge, and you can see that the wedge tapers towards the zenith. In southern California, unfortunately, the big cities are on the coast, and their own light domes can cause problems with viewing the evening zodiacal light. In years past, I was able to see the evening zodiacal light from the Temecula Wine Country, out along East Benton Rd. But now sometimes I have trouble seeing it from Anza. For me, the morning zodiacal light, which is best seen in August and September, is easier to see than the evening light.

The zodiacal light approximately coincides with the ecliptic. The light tapers into the zodiacal band, which then widens and brightens at a point opposite the Sun. The widened glow is called the Gegenschein. "Gegenschein" is German for "counter-glow." The Gegenschein is easier to see than the zodiacal band. Both the Gegenschein and zodiacal band require an extremely dark sky. I used to see them routinely during spring nights from Blair Valley, in Anza-Borrego Desert State Park. I also saw them from Terry O.'s place in Anza, but I must say that both phenomena (Gegenschein and zodiacal band) have been essentially invisible from my own place in Anza. Probably my eyes aren't as sensitive as they were years ago.

The zodiacal light, Gegenschein, and the zodiacal band are cause by the scattering of sunlight off tiny particles in the plane of the Solar System. The dust particles originate from myriad collisions and disintegrations of asteroids, comets, and planets, going back to the origins of the Solar System several billion years ago.

Related phenomena are the Kordylewski clouds. I'm betting that most of you have never heard of them. Their existence was confirmed in the 1950s by the Polish astronomer Kazimierz Kordylewski. They are collections of particles at stable gravitational points in the Earth-Moon system. The clouds were predicted by Joseph-Louis Lagrange in 1772. Kordylewski clouds are allegedly faintly visible along the ecliptic, one cloud in each direction 60 degrees away from the Moon. I say "allegedly," not because I doubt the clouds' existence, but because I don't think I've ever talked to anybody who's seen them. I haven't.

I'm going to end by mentioning a phenomenon that I never heard of until the day before I wrote this essay. It's called the "Belt of Venus." You're probably already familiar with the "shadow of the Earth," visible in the eastern sky at dusk. It's literally the Earth's shadow projected onto the atmosphere. Above the shadow is a pinkish arc, due to scattering of the Sun's last rays. That arc is the Belt of Venus. It's a new term to me.

The Belt of Venus by John Garrett (enhanced color saturation)

Clear skies.

Ooops

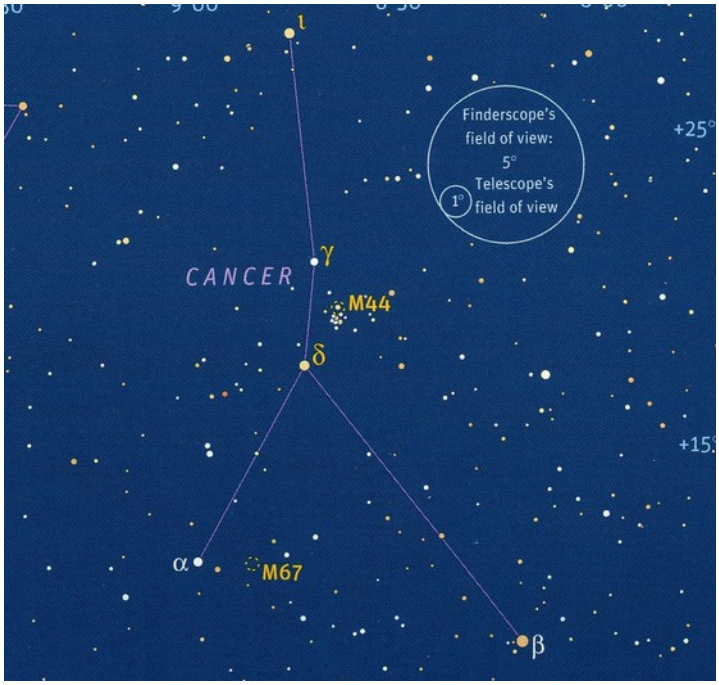
Paul Kreitz was the only person who correctly identified my Ooops. Since my first edition as editor, the newsletter title banner was missing the second 'o' in Astronomer. I'm glad that somebody out there is paying attention.

Art's Night Out
Article 157 March 2015

Back in January of 2015 I described a few objects found in the constellation Gemini. Gemini (The Twins) is still high (almost overhead) in our western sky. The 'heads' of the Twins are stars Pollux and Castor. They are the two brightest stars in the constellation and are just about overhead. To the left (or east) of these two stars appears to be another really bright star. This is actually the planet Jupiter. Lying between Jupiter and Pollux/Castor is another small constellation called Cancer "The Crab". Being this is now high in our night sky, the stars forming the "upside-down Y" are more visible with the naked eye. It is more difficult to see the stars of this constellation then the two objects I want us to find. Look to the right of Jupiter just a few degrees. You will see two stars running up and down from each other. These are Delta on the bottom and Gamma on the top. If you look just to the right of these two stars, about half way between them, you will see a nice open cluster called M-44 or "Beehive Cluster". M-44 is an easy find using binoculars, and can be seen in our light polluted skies of Temecula. On a moonless clear night, this cluster really "pops out" at you. Make sure you are viewing in low power while using a telescope. You'll see that the stars are not too close together, but close enough to give you a nice sparkling cluster of stars.

Now, look downward or south on the left or east side of the "upside-down Y" to the visible star Alpha. This star will be just above two fairly visible stars in the constellation Hydra. These two stars in Hydra are a little closer together than Pollux and Castor in Gemini, and not quite as bright. You'll see that they run horizontal next to each other. If you have located Alpha in

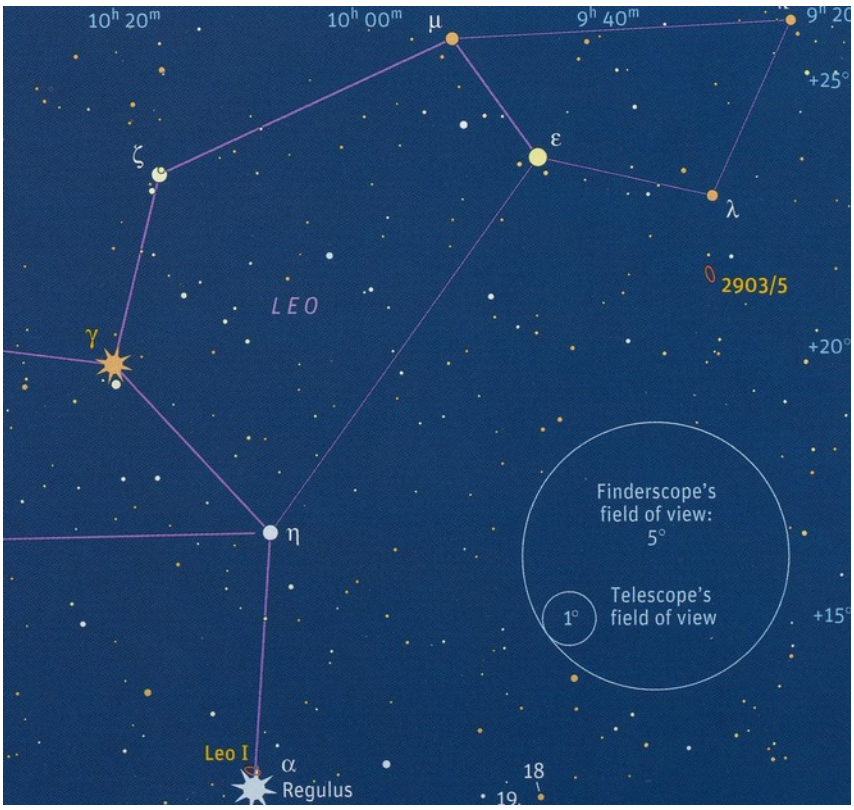
Cancer, look to the right, or west, about a degree and ½ and up a little. You should see a small hazy oval (depending upon your instrument of viewing). I can see this object using my 4.5" refractor at about 35 power. This is the open star cluster M-67. Through binoculars, this may appear to look more like a galaxy. It is fairly dense and has a nice oval shape. As you increase in power using a telescope, you'll see the stars spread out and form this nice open cluster.



Now, look back at Jupiter again. To the left or east of Jupiter is the constellation Leo. Leo (The Lion) is our spring constellation that enters the beginning of the 'Galaxy Constellations' well into the summer months. The "head", "shoulders" and "Chest" of Leo forms what looks like a "sickle" or reversed "question mark". I'll refer this as the "sickle" for simplistic reasons. The star at the bottom of the 'sickle' is Regulus or Alpha. Regulus is the brightest star in the area, which makes it easy to find. Straight up from Regulus is star Eta. Up and to the left a little is star Gamma. Gamma is brighter than Eta, but not as bright as Regulus. Straight up from Gamma is star Zeta. Up and to the right of Zeta is star Mu. Mu appears to be the 'top' star of the sickle. Down and to the right of Mu is star Epsilon, which appears to be the 'tip' of the sickle visually. Okay these describe what appears to be the 'sickle' of Leo.

Viewing galaxies in Leo will require fairly dark skies. Some suggestions in our local area would be the Santa Rosa Plateau or out at Mark Baker's property east of Temecula. The darker the skies, the more detail of the galaxies will be visible. You will also need a moonless night and good clarity in the sky.

With that said, the first object I'd like to describe is a galaxy off of the end of the 'sickle'. I have described the 'tip' of the sickle as star Epsilon. If you have fairly dark skies, you can also find down and to the right of Epsilon another star called Gamma. Gamma is out about the same distance as between Mu and Epsilon. If you look down from Gamma about 1 ½ degrees, you should be able to find the galaxy NGC2903. This is a nice oval shaped 'spiral galaxy' seen at about a 9th magnitude in brightness. 9th magnitude is at about our visible limit in telescopes in and around the Temecula area on a moonless, clear night. Again, the darker the skies, the more detail you can see and brighter will be the galaxy.



For the next objects, you'll need to be in a dark sky area. Suggestion would be the upper desert away from town, or even Curtis' or Terry's place in Anza. Find star Gamma again (two stars up from our bottom star Regulus). Gamma is a 'double star' that has a separation of about 4.5 arc seconds. This separation should be fairly easy to see in low powered scopes. Just to the left of Gamma is a galaxy that can be seen in dark skies. This is galaxy NGC3227. This one is barely visible at a magnitude 10. Usually a magnitude 10 can be seen in dark skies using at least an 8" diameter scope. This is a little challenging as it has a low surface brightness.

Another challenge is the galaxy that is just to the left of Regulus. This galaxy called Leo 1. This one has a little better surface brightness, but is a challenge due to the brightness of

Regulus. You have to put Regulus just outside of your field of view in order to pick out this galaxy.

Next month I'll bring us into the center portion and tail area of our Lion, Leo.

Until next time, Art