Temecula Valley Astronomer

The monthly newsletter of the Temecula Valley Astronomers Mar 2016

Events:

General Meeting : Monday, Mar 14, 2016 (Special date - 2nd Monday) at the Temecula Library, 30600 Pauba Rd, Rm. B at 7 pm.

President Mark Baker's comments will by followed by Chuck Dyson and "What's Up". Our main speaker is Kin Searcy of the SDAA who will speak on the Science of the Palomar Observatory

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

NASA APOD 2 Jul 2015 - Venus and Jupiter are Close
Composite Image Credit & Copyright: Wang, Letian

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/2016
by President Mark Baker

I have always been a strong proponent of learning, regardless of demographic you may belong to. It keeps the mind young and strong…

That's why I am so glad I took on being a Solar System Ambassador, because mental exercise and stimulation were not even a consideration for doing so initially. Following are the telecons, tutorials, and workshops I've been party to in JUST the first two months alone:

- Mars Science Laboratory / Curiosity, recent results of the
- NASA's Airborne Science Program
- CHARM: the oceans below the surface of Enceladus
- OSIRIS Rex
- ISS – themed design challenges for students
- NASA Space Place implementation
- NASA Global Temperatures and Climate Conditions telecom
- Engaging girls in STEM programs
- Hubble Hangout: WFIRST
- Solar Eclipses and transit of Mercury telecom
- New Horizons update
- Hubble Hangout: Super Jupiter hot and cloudy weather
- The Impact of Discovery workshop
- Next Generation Science Standards Telecon
- Science Education for Disabled Students

As you can see, my brain is being stuffed to the point of bursting, and I'm loving every bit of it. My point being is that there are opportunities for all of us to continue to learn and gain knowledge, especially in arenas and disciplines that we love!!! I hope when you get the chance, you'll jump on it…

As always, I appreciate all you do for the science and art we love – Astronomy.

Clear, Dark Skies my Friends…

Looking Up – March 2016
by Curtis Croulet

Daylight Saving Time begins at 2:00 AM on Sunday, March 13.

The **Vernal Equinox** occurs at 9:30 PM March 19. At that time, the Sun crosses the celestial equator, heading north.

Last Quarter Moon is March 1 at 3:11 PM PST; **New Moon** is March 9 at 5:54 PM PST; **First Quarter Moon** is March 14 at 10:03 AM PDT; **Full Moon** is March 23 at 5:01 PM PDT; Last Quarter Moon (again) is March 31 at 11:17 AM PDT.

There will be a **penumbral eclipse of the Moon** on the morning of March 23. The Moon will cross the partly-lit penumbra of the Earth's shadow. Part of the Moon will be outside the penumbra, being uneclipsed. We will see the beginning of the eclipse at 2:39:31 AM and mid-eclipse at 4:47:14 AM. But the Moon will have set by the time the eclipse ends at 6:54:53 AM.

Mercury is unavailable for viewing this March. The best evening apparition of Mercury in 2016 will be in April.

Venus sinks ever closer to the Sun, rising only 25 minutes before the Sun by the end of March. Venus slightly dims from magnitude -3.9 to -3.8.

Mars rises shortly before midnight for most of March. Opposition for **Mars** is May 22, 2016. **Jupiter** reaches opposition on March 8, 2016. At that time, Jupiter will be on the opposite side of the Sun from the Earth. More about **Jupiter** below.

Saturn is still a morning object. Opposition is the night of June 2-3.

Uranus is leaving rapidly exiting the evening sky. **Uranus** will be unviewable by the end of March, joining **Neptune** and **Pluto** in the daytime sky.

There are no good **meteor showers** in March.

Let's look up.

Jupiter season is upon us, and I offer here some salient information that we can share with our guests at outreach events.

As mentioned above, Jupiter reaches opposition on the morning of March 8. Although amateur astronomers often think of opposition as the beginning of the viewing season for Jupiter, it is well to consider that, from that time on, the planet slowly shrinks and dims. At opposition on March 8, Jupiter will be 44.3 arc seconds across, magnitude -2.5. By the time Jupiter becomes unobservable in September, it will have shrunk to 30.5 arc seconds across – almost a one-third reduction in size. It will have dimmed to magnitude -1.7. What I'm saying is that you should start viewing Jupiter now, while it's still growing and brightening.

Jupiter at opposition will be 4.435 astronomical units from Earth, or about 412 million miles. Saturn at opposition is almost twice as far. I mention this because outreach guests sometimes complain about the small size of Saturn, especially after they've seen Jupiter. There will be a period this summer where we can offer both planets at outreach events.
Jupiter's physical diameter at its equator is about 88,793 miles, or 11 times larger than the Earth. Jupiter consists mostly of hydrogen gas, with some methane and other gasses. We don't know for sure if it has a solid core. Jupiter's gravity at its "surface" is about 2.53 times that of Earth.

Jupiter rotates in almost 10 hours. During the average 2 hour outreach event, Jupiter rotates quite noticeably. It revolves around the Sun in almost 12 years. Jupiter is in eastern Leo now. In 12 years it'll be slightly further east, in westernmost Virgo. Jupiter moves about one constellation (or "zodiacal sign") every year.

When viewed in the telescope, Jupiter shows alternating light and dark bands or "stripes." The light bands are properly termed "zones," while the dark bands are "belts." The zones are where gas is rising. The belts are where gas is sinking. The belts rotate with the planet at different speeds. The dark north and south equatorial belts are visible at low power in even the smallest telescopes. Larger telescopes show more zones and belts, but the average outreach visitor may not see them without verbal coaching.

The Great Red Spot, Jupiter's most famous visible feature, is shrinking and fading. In fact, its shrinkage is accelerating. It may disappear within the lifetimes of our younger outreach guests. The brick red color many of us remember from our youth has faded to a pale pink.

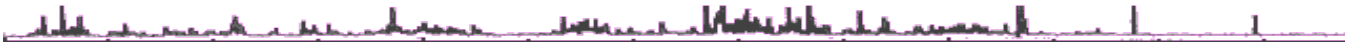
Jupiter has 67 known "moons" or satellites. Most of them are too faint to see in amateur telescopes, but the four brightest moons are visible even in ordinary binoculars. These moons were discovered by Galileo in 1610, and they are often called the "Galilean moons." In order, from closest to farthest from Jupiter, they are Io, Europa, Ganymede, and Callisto. The Galilean moons move quickly, especially the innermost moon, Io (pronounced "eye-oh" or "ee-oh" – your choice). Io moves visibly during the typical two hour duration of an outreach event. Because the moons can pass in front of or behind Jupiter, only three or even as few as two may be visible at a given time. Sometimes the moons cast visible shadows on Jupiter.
Io is slightly larger than Earth's Moon, 2,273 miles in diameter (Moon = 2,160 miles). Io is geologically active. Its surface has volcanoes that spew sulfur and sulfur-dioxide. The interior of Io is being pulled about by the gravity of Jupiter and by the other moons.

Europa is the smallest of the Galilean moons at 1,938 miles in diameter, or slightly smaller than Earth's Moon. Europa's surface is a crust of water ice. The surface appears to be smooth surface with chaotic cracks. Europa's interior is probably silicate rock. A hypothesis holds that liquid water lies beneath the icy surface, and Europa may even harbor life.
Ganymede is the largest moon in the Solar System, nearly 3,300 miles in diameter. In fact, it's larger than the planet Mercury, but it's only half as massive as Mercury. Ganymede is also mostly composed of silicate rock and water ice, but it has an iron core. It may have a salt-water ocean beneath its surface.

Callisto is the outermost Galilean moon. At almost 3,000 miles in diameter, it is the Solar System's third largest moon. It also consists of silicate rock, water ice, carbon dioxide, and organic compounds. Callisto may have a subsurface ocean of liquid water. In space probe photos it is heavily cratered. Visually, Callisto moves the slowest of the Galilean moons, and sometimes it may be out of the field of view, depending upon your chosen magnification.

Have fun with Jupiter!

Clear skies.



Random thoughts
by Chuck Dyson

When I turned sixteen as part of my right of passage into junior adulthood I naturally acquired a driver's license and the old family car. This was before the era of children just having to have a new car or they will be so, so embarrassed at school that they will just die on the spot. This was the era of if something worked it was a hand-me-down and you got it, or you got nothing. Now my family lived in the west end of Kern County (that would be everything West of Bakersfield CA) the population of the entire west end was 12,000 souls in an area slightly larger than the state of Delaware population, at that time, 450,000 crowded souls. On weekends when we had two dollars for gas and two dollars for 22 shells a group of us would go out to the soda lake area, now know as the Carrizo plain National Monument and drive around at night plinking at rabbits (shooting the 22's in the rabbits general direction) not legal but there was no one out there and we literally had the whole valley to ourselves. Sometimes we would stop, turn off the car lights, and just look out into the night no people, no lights, just the night and us with stars for company. Time passed we went to college, married, started careers and families and had no time for spending nights in a deserted desert.

When I retired just over two years ago one of the reasons I wanted to move to Menifee was to be close to the desert again where I find some solitude and take a break from society. As Gomer Pyle would say "Surprise, surprise!" no stopping at any time signs, fences some topped with barbed wire, and locked gates across every dirt road in the area were the order of the day and as for no people, OH my gosh, there are people everywhere. But what really bothered me was the denial of access to any open area everywhere in California it is like living in a minimum security prison. I began to wonder am I the only one bothered by this.

At first when I received my January Sky and Telescope I was quite excited because of the killer article on the upcoming eclipse in 2017 as I will most definitely be attending the event, it's a bucket list thing you know. However, when I started reading the magazine in my usual fashion and that is from back to front, I like to read the Focal Point editorial first, I saw that Tony Flanders had written an article regarding America's growing sense of fear over the perceived loss of personal safety, fueled by local news rooms that report every bad event even if it occurs completely across the nation and has no effect on us at all but because we hear from a local station we think of it as a local event (this phenomena is known as telescoping although no actual telescopes are used and no astronomers are involved). The roar of danger from the evening news has created a tidal wave of demands from the public for action. This tidal wave has created a frenzy among the politicians to do something; but what, well light the night (dark is bad, light is good) and fence in all roads (open fields bad, fenced road good and never mind the occasional pesky hit-and-run driver).

What now stands against this defining roar and this mighty wave; just a trickle of science papers, good science takes time and costs money, showing that most night lighting is not effective in reducing crime, is over used thus wasteful of tax payers money, and may by disrupting your wake sleep cycles lead to long term health issues, we can only say may at this point because there is a trend only and not enough data to show a statistically significant effect. From this trickle of papers there comes only a whisper of caution from the researchers

and the odd person who just happens to read one of the papers but from the politicians, newscasters, and self-appointed gurus of issues, nothing as they make a point of never going to a science meeting or reading a technical paper, facts just get in the way of agendas you know.

I would like to thank Mr. Flanders for raising his voice against this national desire to light up the night and lockup the areas that cannot be lit, all for our own good and safety. I know not how old Mr. Flanders is but he seems a mature adult and as for me, well I am 70 and I think neither Mr. Flanders nor I would have reached our ages without some idea of how to assess, accept, and manage risk. In addition to astronomy I love body surfing and in bodysurfing there is risk, especially with bigger waves, and when I catch a large wave I know that I could be held down if I am forced under or break bones if I am tossed out at the beach, but when you catch the wave, drop down, and start plaining it's all worth it, shooting diagonally to the beach faster than you could ever swim it is definitely worth it.

I along with Mr. Flanders would like to suggest that getting back some of the urban night sky through a reasonable and rational lighting policy and having access to easily accessible undeveloped suburban areas with darker skies would definitely be worth it too.

Cheers all

Chuck

The Closest New Stars To Earth
by Ethan Siegel

When you think about the new stars forming in the Milky Way, you probably think of the giant star-forming regions like the Orion Nebula, containing thousands of new stars with light so bright it's visible to the naked eye. At over 400 parsecs (1,300 light years) distant, it's one of the most spectacular sights in the night sky, and the vast majority of the light from galaxies originates from nebulae like this one. But its great luminosity and relative proximity makes it easy to overlook the fact that there are a slew of much closer star-forming regions than the Orion Nebula; they're just much, much fainter.

If you get a collapsing molecular cloud many hundreds of thousands (or more) times the mass of our sun, you'll get a nebula like Orion. But if your cloud is only a few thousand times the sun's mass, it's going to be much fainter. In most instances, the clumps of matter within will grow slowly, the neutral matter will block more light than it reflects or emits, and only a tiny fraction of the stars that form—the most massive, brightest ones—will be visible at all. Between just 400 and 500 light years away are the closest such regions to Earth: the molecular clouds in the constellations of Chamaeleon and Corona Australis. Along with the Lupus molecular clouds (about 600 light years distant), these dark, light-blocking patches are virtually unknown to most sky watchers in the northern hemisphere, as they're all southern hemisphere objects.

In visible light, these clouds appear predominantly as dark patches, obscuring and reddening the light of background stars. In the infrared, though, the gas glows brilliantly as it forms new stars inside. Combined near-infrared and visible light observations, such as those taken by the Hubble Space Telescope, can reveal the structure of the clouds as well as the young stars inside. In the Chameleon cloud, for example, there are between 200 and 300 new stars, including over 100 X-ray sources (between the Chamaeleon I and II clouds), approximately 50 T-Tauri stars and just a couple of massive, B-class stars. There's a third dark, molecular cloud (Chamaeleon III) that has not yet formed any stars at all.

While the majority of new stars form in large molecular clouds, the closest new stars form in much smaller, more abundant ones. As we reach out to the most distant quasars and galaxies in the universe, remember that there are still star-forming mysteries to be solved right here in our own backyard.

Image credit: NASA and ESA Hubble Space Telescope. Acknowledgements: Kevin Luhman (Pennsylvania State University), and Judy Schmidt, of the Chamaeleon cloud and a newly-forming star within it—HH 909A—emitting narrow streams of gas from its poles.

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