Temecula Valley Astronomer

The monthly newsletter of the Temecula Valley Astronomers Feb 2018

Events:

General Meeting : Monday, Feb 5, 2018 at the Temecula Library, Room B, 30600 Pauba Rd, at 7 pm.
After the usual opening comments by President Mark Baker and "What's Up" by Skip Southwick, Clark Williams will speak on "Why Systems Form in Spinning Flat Disks and How That Led to the Discovery of Dark Matter".

Please consider helping out at one of the many Star Parties coming up over the next few months. For the latest schedule, check the Calendar on the web page.

29 Sep 2015 – NASA APOD - Supermoon Total Lunar Eclipse and Lightning Storm. Image Credit & Copyright: Jose Antonio Hervás

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
by President Mark Baker

OUTREACH…!!! A simple word that defines the lifeblood of our organization. I'm always thankful for those that sacrifice their time and even money to open up the skies for our local students and community members. And yes, sometimes it can be quite a sacrifice…

But when I think how "bad" we have it sometimes, I think of other groups I associate with in Southeast Asia or Australia and count our lucky stars, pun intended!!! The TASOS group in Singapore is one to be admired…not only are their skies subjected to some of the worst light pollution imaginable, but toss in some temperamental weather on top of that and observing becomes a real challenge. But what they go through to provide regular Star Parties in no way deters their dedication and love for the celestial orb!!!

When last there, Deborah and I were party to a special viewing arrangement that commenced with a tropical downpour for about 20 minutes. But as soon as it stopped, out came the dozen or so scopes and literally hundreds of people started lining up to catch a glimpse of the night skies. It was still so "humid" though, that every couple of minutes found the astronomer or assistant wiping off the refractor lenses and even reflector mirrors where feasible!!! Still, the show went on…

So here's to the TVA for keeping our shows going on, and an added invite to those that want to enjoy the thrill of a child or adult getting to see a Saturn, a cluster, or even a nebula for the first time…you don't need a scope or binocs even!! Just a little knowledge of What's Up that night and maybe a laser pointer…we can maybe have too many scopes – maybe!! – but we can never have enough mentoring.

Again, as always, thanks for what you all do to open up the heavens for those who maybe wouldn't otherwise even look up!!

Clear, Dark Skies my Friends…

Looking Up Redux
by Clark Williams

ALL TIMES ARE LOCAL PST WILDOMAR

Times are given in 24-hour time either as hh:mm:ss or hhmmss. A time given as hhmm+ *indicates that it is the hour of the next day. Similarly a time hhmm− indicates a time in a previous day.*

Moon Phases for the month by date:

2018-02 BLACK MOON no FULL moon this month
2018-02-07 Wednesday @ 07:55:10 PST LAST QTR
2018-02-15 Thursday @ 13:06:23 PST NEW
2018-02-23 Friday @ 00:10:14 PST FIRST QTR

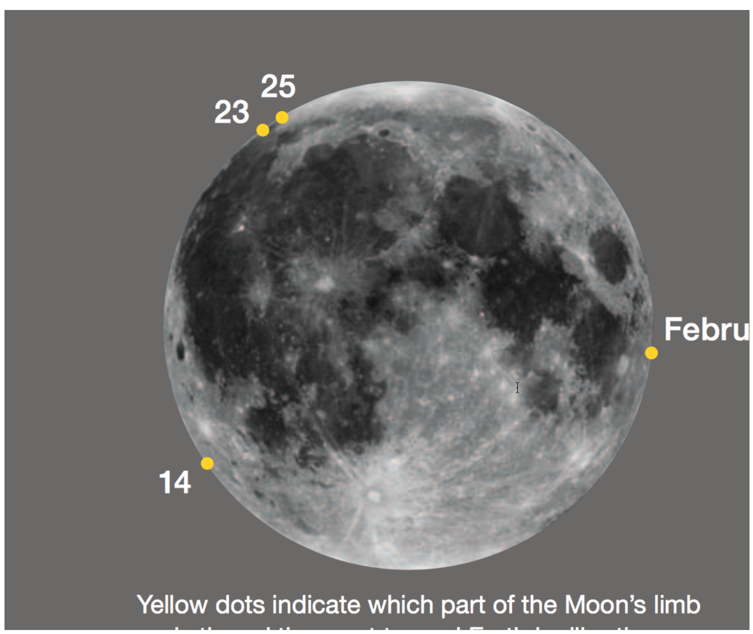
Feb 27 14:50 363936 km F-2d10h Mar 11 9:15 404681 km N-6d 3h

Perigee comes on 2018-02-27 @ 14:50 363,933 km (226,138 mi)
Apogee comes on 2018-02-11 @ 18:11 405,700 km (252,091 mi)

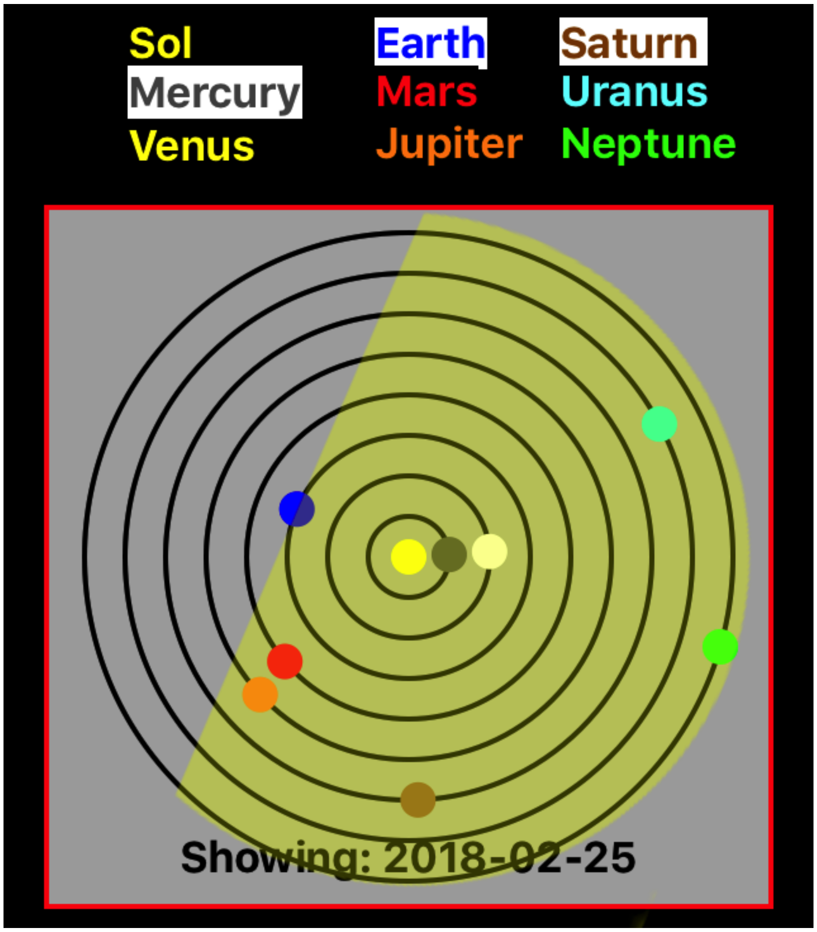
2018 has: (12) new moons, (12) 1st Qtr moons, (14) Full moons, (13) 3rd Qtr moons (2) Blue moons and (1) Black moon

Luna:

Luna can be found in Leo at the beginning of the month. Since the planets are all hard to see until May (unless you love EARLY mornings) Luna makes both a good viewing and imaging object. Especially if you want to catch some craters in Libration. The first of February offers up Boguslawsky's Crater on the far eastern limb of the moon. Valentine's Day (14 February) offers up Mare Orientale in the southwestern limb.



You can pick up Petermann's Crater on the 23rd and Anaxagoras' Crater on the 25th both in the northwest limb as shown in the image above.



Planets:
Planetary Positions February 2018:

- **Mercury:** Mercury will be pretty much lost in the sun's glare.
- **Venus:** Is right next to Mercury.
- **Mars:** Mars is no better: However Mars is beginning to move into a more favorable position.
- **Jupiter:** Jove is also gone for the entire month but he too is beginning to move into darker skies.
- **Saturn:** Saturn has nothing to display spending his time in the daylight this month.
- **Uranus:** Even Uranus and Neptune both VIPs (Visually Interesting Planets) of the January night skies are slipping into Sol's glare.
- **Neptune:** (see Uranus)
- **Pluto:** My favorite PLANET (besides earth of course) is unfortunately a waste this month too. Visual Magnitude of +JU (just unobservable) and spending most of its time in Sol's glare.

This planetary observing dearth will continue until May!

Meteors:
- February just doesn't have anything interesting for meteors in 2018.

Comets:
- There are several comets coming in 2018 but for February they all have an apparent magnitude between 15 and 26. April will show an improvement in comets.

Deep Sky:

In each case you should look for the following on or about the 15th Day of February 2018 at 2100 PST and you will have about 20 minutes of viewing time total.

The one thing February does bring is a chance to hone your Messier Marathon imaging skills.

Messier Objects:

- M103 – an open cluster where a few thousand stars formed in the constellation Cassiopeia. This open cluster was discovered in 1781 by Charles Messier's friend and collaborator Pierre Méchain. It is one of the most distant open clusters known, with distances of 8,000 to 9,500 light-years from the earth and ranging about 15 light-years apart. There are about 40 member stars within M103, two of which have magnitudes 10.5, and a 10.8 red giant, which is the brightest within the cluster.
- M82 – a starburst galaxy about 12 million light-years away in the constellation Ursa Major. A member of the M81 Group, it is about five times more luminous than the whole Milky Way and has a center one hundred times more luminous than our galaxy's center. The starburst activity is thought to have been triggered by interaction with neighboring galaxy M81. As the closest starburst galaxy to Earth, M82 is the prototypical example of this galaxy type.
- M35 – an open cluster in the constellation Gemini. It was discovered by Philippe Loys de Chéseaux in 1745 and independently discovered by John Bevis before 1750. The cluster is scattered over an area of the sky almost the size of the full moon and is located 850 parsecs (2,800 light-years) from Earth.
- M64 – a galaxy which was discovered by Edward Pigott in March 1779, and independently by Johann Elert Bode in April of the same year, as well as by Charles Messier in 1780. It has a spectacular dark band of absorbing dust in front of the galaxy's bright nucleus, giving rise to its nicknames of the "Black Eye" or "Evil Eye" galaxy.
- M42 – a diffuse nebula situated in the Milky Way, being south of Orion's Belt in the constellation of Orion. It is one of the brightest nebulae, and is visible to the naked eye in the night sky. M42 is located at a distance of 1,344 ± 20 light years and is the closest region of massive star formation to Earth. The M42 nebula is estimated to be 24 light years across. It has a mass of about 2,000 times that of the Sun.
- M47 – an open cluster in the constellation Puppis. It was discovered by Giovanni Batista Hodierna before 1654 and independently discovered by Charles Messier on February 19, 1771. It was later independently discovered again, under the current name NGC 2422. There is actually no cluster in the position indicated by Messier, which he expressed in terms of its right ascension and declination with respect to the star 2 Puppis. However, if the signs of Messier's coordinate differences are changed, the position matches that of NGC 2422. Until the equivalency of M47 with NGC2422 was found, M47 was considered a lost Messier Object. The discovery that M47 and NGC2422 were the same cluster only came in 1959 with a realization by Canadian astronomer T. F. Morris.

NGC Objects:

- NGC 457 – an open star cluster in the constellation Cassiopeia. It was discovered by William Herschel in 1787, and lies over 7,900 light years away from the Sun. It has an estimated age of 21 million years. The cluster is sometimes referred by amateur astronomers as the Owl Cluster, Kachina Doll Cluster, the ET Cluster (due to its resemblance to the movie character) or the "Skiing Cluster". Two bright stars, magnitude 5 Phi-1 Cassiopeiae and magnitude 7 Phi-2 Cassiopeiae can be imagined as eyes. The cluster features a rich field of about 150 stars of magnitudes 12-15.
- NGC 884 – an open cluster located 7600 light years away in the constellation of Perseus. It is the easternmost of the Double Cluster with NGC 869. NGC 869 and 884 are often designated h and χ Persei, respectively. The cluster is most likely around 12.5 million years old. Located in the Perseus OB1 association, both clusters are located physically close to one another, only a few hundred light years apart. The clusters were first recorded by Hipparchus, but have likely been known since antiquity.

These are great for imaging especially in this no planet lull and may get you into practice for the March Messier Marathon.

For now – Keep looking up.

Random Thoughts
by Chuck Dyson

The Journey of 1000 Li Begins With One Step
Lao Tzu

Today this saying is translated to miles instead of li and it has the ring of truth about it as the journey never gets done unless you start the journey and commit to it. As a manager I soon learned that the staff could argue over a problem all day and never get anything done, but if I could get someone to actually do some work on the project then it was usually finished in several hours. I recently found a site that actually gave the actual distance of the li and as most civilizations have a distance that is more-or-less the equivalent of a mile I and I'll bet many others assumed that the li was more-or-less a mile. No! It turns out that the li is actually equal to 360 miles; so, Lao Tzu was suggesting that we go for a hike to the Moon and ¼ the way back to Earth, quite the suggestion. The 1000 mile interpretation of Lao Tzu's comment is that all journeys appear long until you start them. The 360,000 mile journey perhaps indicates that Lao Tzu was suggesting all journeys are impossible until you start them.

The reason for the saying by Lao Tzu is that on December 24th Barb and I always take our children and grandchildren to Knott's Berry Farm for a family day and one of the mandatory items of activity during each visit is to drag grand pop through each and every gift, code for junk, shop there. In one of the shops I noticed a giant blow-up of the park from 1955 and on it was an attraction labeled "observatory". If there was an observatory at Knott's 60 years ago then I must find out about it and the person who operated it and thus began my journey of 1000 li. Unfortunately, as I write this, I have very little information on the observatory and finding any information about the observatory or its operator is proving extremely difficult and that is despite the help that the Knott's archival department has given me. The good news is that as I searched for information about the Knott's observatory I uncovered volumes of information concerning other small observatories in our area and some local amateur astronomers who were significant players in developing the equipment used in the major observatories in our area.

The observatory that I will highlight this month is at the San Bernardino Valley College and I will introduce you to the local astronomers who helped make it functional. If you hop on the 215 and head North and, assuming that you do not want to go to Barstow for dinner, you can exit at Inland Center Rd. and instead of going east to the shopping center you can go west and in less than ½ of a mile be at the San Bernardino Valley College. The College was started with the appointment of a school board in 1926 and is the twenty-fifth junior college to be started in California. In 1926 the voters of San Bernardino approved the formation of the college, elected a board of trustees, and approved a bond issue of $485,000 to finance the new college. Construction of the college was started in 1927; please note that this was how things happened in California before the advent of environmental impact studies and lawsuits that are filed by disaffected splinter political groups. The president of the Board of Trustees for the college, a Mr. Noble Asa Richardson, was both a strong advocate of science curriculums and an avid amateur astronomer, had $3130 earmarked for an observatory. In 1930 the observatory was completed and had a rotating metal dome that cost $1,091 and a used 16 inch Newtonian reflector with a very unsatisfactory mount that cost $350. Within a year Mr. Richardson would be dead but not apparently before he was able to get a local dentist to look at the telescope and mount to see if he could improve upon it. From the beginning Mr. Richardson's hope of having San Bernardino College become a center for science studies was an outstanding success and the astronomy classes were very well attended so much so that there was a popular lecture series by local astronomers to the students and public. One of the speakers was a young astronomer named Edwin Hubble. Hubble was definitely not a happy camper at this time and was reported to be driving G. E. Hale nuts with his complaints. To be fair to Mr. Hubble, his complaints were mostly about the 100 in Hooker telescope up on Mt. Wilson and had significant merit. The major problems with the Hooker were that the glass for the mirror was essentially discarded and remelted wine bottles and the mirror had been made from three separate pours layered one on top of the other so when the temperature changed the mirror really changed its shape and this ruined many a photographic exposure; Hubble's second and frequent complaint with the Hooker was the closed yoke mount on the scope that prevented the scope from photographing large portions of the northern sky. The dentist that Mr. Richardson had look at the college scope was a Dr. H. Page Bailey who had come from Wisconsin and had attended dental school at USC where he, before graduating in 1911, built the school's first dental X-ray machine, showing early promise of mechanical ability. In 1926 Dr. Bailey exchanged dental work for a 15 inch mirror blank and soon had finished the mirror and mounted it in a telescope. Several more scopes followed the original one. Because of Dr. Bailey's extensive experience with building telescopes and mounts he was Mr. Richardson's first choice to look at and hopefully improve on the college's telescope. Dr. Baileys first action was to move the focuser and eyepiece from the Newtonian focus on the top of the scope to the Cassegrain focus on the bottom of the scope and this made it much easier for the students to use the telescope. Dr. Baileys second action was to replace the old mount with a new one. Dr. Bailey had been working on a closed yoke mount but, like Hubble, was unhappy with its limitations and so had started working with a split ring horseshoe mount that allowed the telescope to point to Polaris and thusly made all of the sky observable by the telescope. So, as Mr. Hubble was lecturing to the staff, students, and public at the college, Dr. Bailey was building the telescope prototype that would help confirm to the Palomar engineering team that their idea of using the same split ring horseshoe for the 200 inch scope was valid. With a little help from the Corning glass works, Mr. Hubble got the telescope that would finally make him happy, or as happy as he could ever be. All of this was thanks to the vision of one amateur astronomer and the mechanical ability of another.

Note 1: In 1927 $485,000 would buy 20 acres of land and build a college. I have just received my February issue of Car and Driver magazine and in it is the profile of Ford's latest super car that is simply called the GT and the price of the car is, minus tax and license fees, $525,750. And the moral of this story is that the money that would buy a college in 1927 will not even buy 1 super car today.

Note 2: The planetarium at San Bernardino Valley College opened in 1977 and in 1978 Chris Clarke started helping out there as a student, after graduation he continued to help at the planetarium and later joined the staff full time. Chris has just retired but continues to help out at shows and with observing sessions. Chris was very helpful and answered many of my questions for this article. Should you go to a show and observing session and should Chris be there to answer your questions consider yourself fortunate to have meet him.

Cheers
Chuck

NASA SpacePlace

Sixty Years of Observing Our Earth

By Teagan Wall

Satellites are a part of our everyday life. We use global positioning system (GPS) satellites to help us find directions. Satellite television and telephones bring us entertainment, and they connect people all over the world. Weather satellites help us create forecasts, and if there's a disaster—such as a hurricane or a large fire—they can help track what's happening. Then, communication satellites can help us warn people in harm's way.

There are many different types of satellites. Some are smaller than a shoebox, while others are bigger than a school bus. In all, there are more than 1,000 satellites orbiting Earth. With that many always around, it can be easy to take them for granted. However, we haven't always had these helpful eyes in the sky.

The United States launched its first satellite on Jan. 31, 1958. It was called Explorer 1, and it weighed in at only about 30 pounds. This little satellite carried America's first scientific instruments into space: temperature sensors, a microphone, radiation detectors and more.

Explorer 1 sent back data for four months, but remained in orbit for more than 10 years. This small, relatively simple satellite kicked off the American space age. Now, just 60 years later, we depend on satellites every day. Through these satellites, scientists have learned all sorts of things about our planet.

For example, we can now use satellites to measure the height of the land and sea with instruments called altimeters. Altimeters bounce a microwave or laser pulse off Earth and measure how long it takes to come back. Since the speed of light is known very accurately, scientists can use that measurement to calculate the height of a mountain, for example, or the changing levels of Earth's seas.

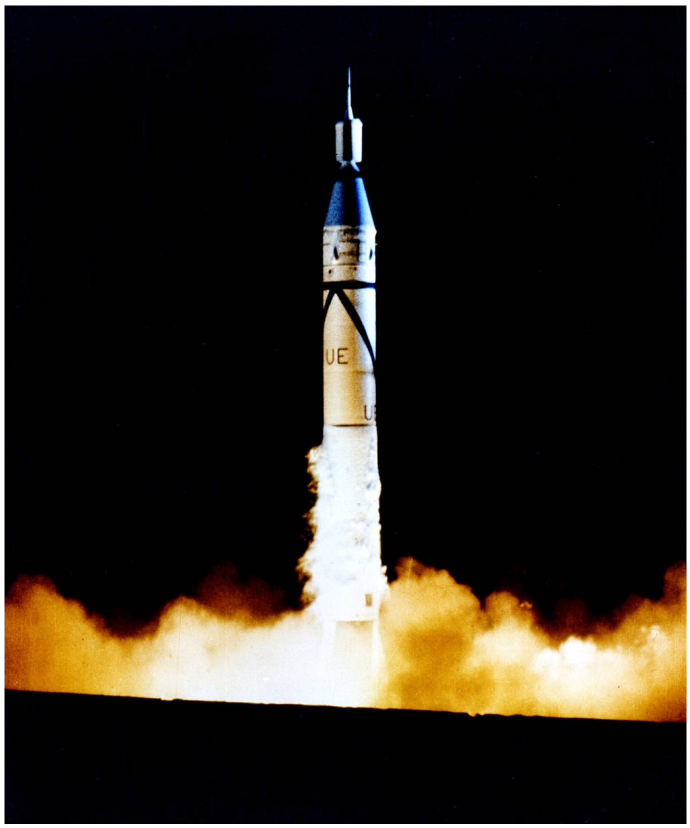
Satellites also help us to study Earth's atmosphere. The atmosphere is made up of layers of gases that surround Earth. Before satellites, we had very little information about these layers. However, with satellites' view from space, NASA scientists can study how the atmosphere's layers interact with light. This tells us which gases are in the air and how much of each gas can be found in the atmosphere. Satellites also help us learn about the clouds and small particles in the atmosphere, too.

When there's an earthquake, we can use radar in satellites to figure out how much Earth has moved during a quake. In fact, satellites allow NASA scientists to observe all kinds of changes in Earth over months, years or even decades.

Satellites have also allowed us—for the first time in civilization—to have pictures of our home planet from space. Earth is big, so to take a picture of the whole thing, you need to be far away. Apollo 17 astronauts took the first photo of the whole Earth in 1972. Today, we're able to capture new pictures of our planet many times every day.

Today, many satellites are buzzing around Earth, and each one plays an important part in how we understand our planet and live life here. These satellite explorers are possible because of what we learned from our first voyage into space with Explorer 1—and the decades of hard work and scientific advances since then.

To learn more about satellites, including where they go when they die, check out NASA Space Place: https://spaceplace.nasa.gov/spacecraft-graveyard



This photo shows the launch of Explorer 1 from Cape Canaveral, Fla., on Jan. 31, 1958. Explorer 1 is the small section on top of the large Jupiter-C rocket that blasted it into orbit. With the launch of Explorer 1, the United States officially entered the space age. Image credit: NASA

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The TVA is a member club of The Astronomical League.