



Temecula Valley Astronomer

The monthly newsletter of the Temecula Valley Astronomers April 2021

Events:

Virtual meeting via Zoom on **5 April at 7PM**. Join your fellow astronomers for **What's Up**, an **IFI and Gallery** assembled by **Clark Williams**. Watch your club email for meeting ID and password.

Until we can resume our monthly meetings, you can also interact with your astronomy associates on Facebook or by posting a message to our mailing list.



[NASA APOD : 1 April 2005](#) Proof that water was found on Mars as early as 2005!

General information:

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

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WHAT'S INSIDE THIS MONTH:

Cosmic Comments

by President Mark Baker

Editor's Notes

by Mark DiVecchio

Looking Up Redux

compiled by Clark Williams

Random Thoughts – Stars – How did they get their names?

by Chuck Dyson

Watch the Lion: Celestial Wonders in Leo

by David Prosper

Send newsletter submissions to Mark DiVecchio [<markd@sillogic.com>](mailto:markd@sillogic.com) by the 20th of the month for the next month's issue.



Cosmic Comments by President Mark Baker

I started off the March comments with the paraphrase...“MARS is Calling, So We Must Go”!!! To quote myself, I also stated “Like all things, the excitement will wear off over time, pick up again with the flights of Ingenuity, and even that will be “old hat” eventually... but for this moment in time, humanity is looking up in wonder and awe. And I like it...”

Only, the excitement has NOT worn off as I anticipated, and I like that even better!!! Our Star Party guests all still ask about Mars and want to see it, even though it's not much too see. And people are still talking “WE” and how exciting it's been to see and hear the [EDL](#) and the daily progress of Perseverance... and now, most can't wait for Ingenuity to take flight as if they will experience that singular event in human history personally, rather than vicariously!!! This gives me hope for continued extra-planetary activity that someday in the near future will, and must, include humankind...

So, again I thank TVA for their contributions to promoting such a positive and healthy desire to be even a small piece of the big puzzle... and my enthusiasm still boils over right now because of you all. Keep the faith because as I said, “there is much, much more yet to come...!!!” And you can count on it...

Clear, Dark Skies my Friends...

Editor's Note by Mark DiVecchio

After many years of assembling the Temecula Valley Astronomer, it is time for me to step away. I have told President Baker that the April 2021 newsletter will be my last.

Long time contributor to the TVA, Clark Williams will be doing his last “Looking Up Redux” column in the April TVA. Here is another chance for you to give back to the group and become a magnitude zero star.

Mark DiVecchio



Looking Up Redux compiled by Clark Williams

from these sources:

SeaSky.org

Wikipedia.com

in-the-sky.org

The American Meteor Society, Ltd.

cometwatch.co.uk

NASA.gov

TVA App (2.0.1296)

FullAndNewMoon App (2.0)

Starry Night Pro Plus 7 (7.6.3.1373)

SkySafari 6 Pro (6.1.1)

Stellarium (0.18.2)

timeanddate.com/astronomy

<https://www.fourmilab.ch/earthview/pacalc.html>



ALL TIMES ARE LOCAL PACIFIC TIME UNLESS NOTED OTHERWISE

Times are given in 24-hour time as: (hh is hours, mm minutes, ss seconds)

hh:mm:ss or hhmmss

hhmm+ (time of the next day)

hhmm- (time of the previous day)

hhmm (seconds not shown)

yyyymmddThmmss (Full date as: year month day Time separator hours minutes seconds)

Moon Phases for the month by date:

Sunday	the 4 th @ 0303 Third QTR in SAGITTARIUS
Sunday	the 11 th @ 1931 New in PISCES
Tuesday	the 20 th @ 0000 First QTR in CANCER
Monday	the 26 th @ 2032 Full in LIBRA

Apogee comes on 2021-04-14 @ 1748 – 406,119 km (252,351 mi)

Perigee comes on 2021-04-27 @ 1525 – 357,378 km (222,064 mi)

2021 has: (12) new moons, (13) 1st Qtr moons, (13) Full moons, (12) 3rd Qtr moons
(1) Blue moon and (0) Black moons

Daylight Savings: Starts: 2021-Mar-14 : Ends: 2021-Nov-07

Luna: Luna is waning gibbous on the first of the month, headed for 3rd quarter on the 4th rising at **2254-**, transiting at **0411** and setting by **0928**. Luna by mid-month is 14% illuminated. Rising at **0824** and transiting early afternoon at **1536** setting at **2254**. By the-end-of-the-month Luna is once again in waning gibbous, 77% illuminated transiting at **0502** and setting by **1001**.



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Highlights: (distilled from: SeaSky.org and Clark's planetary Orrey program[s])

April 11 - New Moon. The Moon will be located on the same side of the Earth as the Sun and will not be visible in the night sky. This phase occurs at **1931**. This is the best time of the month to observe faint objects such as galaxies and star clusters because there is no moonlight to interfere.

April 22, 23 - Lyrids Meteor Shower. The Lyrids is an average shower, usually producing about 20 meteors per hour at its peak. It is produced by dust particles left behind by comet C/1861 G1 Thatcher, which was discovered in 1861. The shower runs annually from April 16-25. It peaks this year on the night of the 22nd and morning of the 23rd. These meteors can sometimes produce bright dust trails that last for several seconds. The nearly full moon will be a problem this year. Its glare will block out all but the brightest meteors. But if you are patient you may still be able to catch a few good ones. Best viewing will be from a dark location after midnight. Meteors will radiate from the constellation Lyra, but can appear anywhere in the sky.

April 26 - Full Moon, Supermoon*. The Moon will be located on the opposite side of the Earth as the Sun and its face will be fully illuminated. This phase occurs at **2032**. This full moon was known by early Native American tribes as the Pink Moon because it marked the appearance of the moss pink, or wild ground phlox, which is one of the first spring flowers. This moon has also been known as the Sprouting Grass Moon, the Growing Moon, and the Egg Moon. Many coastal tribes called it the Fish Moon because this was the time that the shad swam upstream to spawn. This is also the first of three supermoons for 2021. The Moon will be near its closest approach to the Earth and may look slightly larger and brighter than usual.

Supermoon is an "astrological" term and has no meaning in astronomical terms.

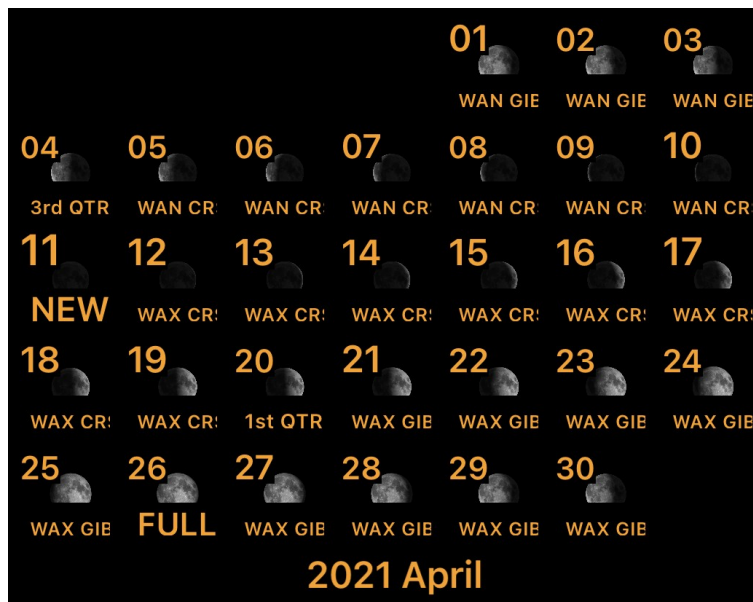


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Algol minima: (All times Pacific Time)

04/02/2021	0923
04/05/2021	0612
04/08/2021	0301
04/10/2021	2350
04/13/2021	2039
04/16/2021	1729
04/19/2021	1418
04/22/2021	1107
04/25/2021	0756
04/28/2021	0445



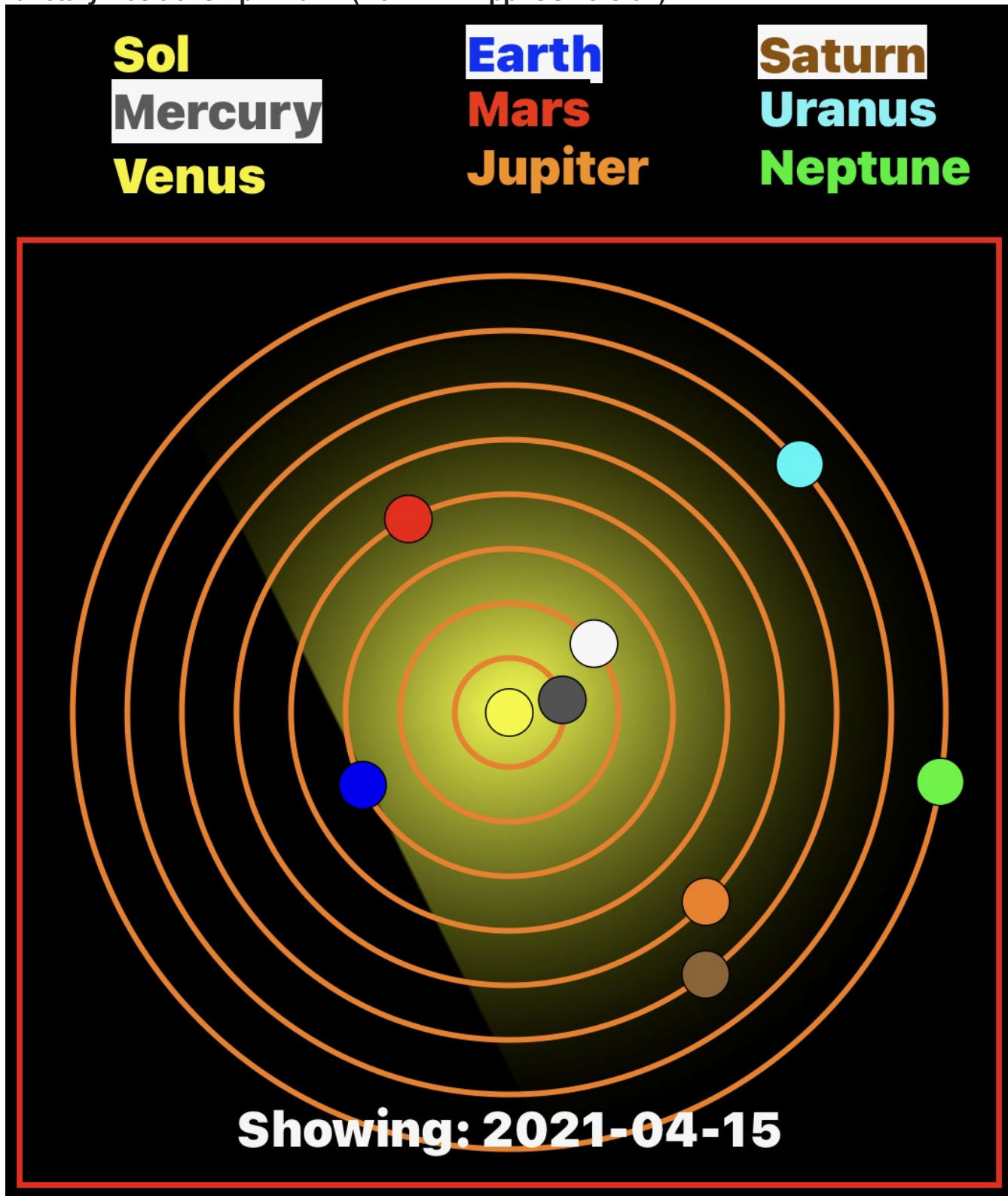


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Planets:

Planetary Positions April 2021: (from TVA App iOS version)





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- **Mercury:** Mercury is a morning object in the beginning of the month. It is illuminated at 86% and -0.49 apparent magnitude. Mercury rises at **0601** with the sun following at **0634**. Mercury by mid-month is lost to the sun. By the 30th Mercury has become an evening object, setting at **2040** preceded by sunset at **1933**.
- **Venus:** Is lost to the sun on the first. By mid-month Venus is setting at **1945** preceded by sunset at **1921**. By the 30th Venus is setting at **2016** preceded by sunset at **1933**.
- **Mars:** Mars transits at **1711** on the first not setting until **0025+**. By mid-month Mars is transiting at **1651** but there is a waxing crescent Moon sitting just over 26° to the west along the ecliptic at 8% illumination. End-of-month finds the Warrior transiting at **1632** and not setting until **2348**.
- **Jupiter:** Jupiter is a morning object on the first of the month rising at **0427** and preceding sunrise at **0634**. By mid-month Jove is rising at **0339** the sun follows at **0616**. Come the end of month Jupiter is peaking above the horizon by **0247** with sunrise at **0559**.
- **Saturn:** Saturn rises about **0350** on the 1st while sunrise is at **0634**. Saturn by mid month is rising by **0258** preceding sunrise at **0616**. By the end-of-the-month Saturn is rising at **0201** followed by the sun at **0559**.
- **Uranus:** On the first Uranus is an evening object setting at **2116** preceding the Sun at **1911**. By the 15th Uranus is setting at **2024**. End-of-month finds Uranus obscured by the Sun.
- **Neptune:** Neptune is rising at **0546** in the beginning of the month. By the 15th Neptune is rising at **0452**, an hour-and-a-half before sunrise at **0616**. By the end of the month Neptune is rising at **0354** and Sol is rising at **0559**.
- **Pluto:** Pluto rises by **0259** on the first of the month preceding sunrise at **0633**, but there is a waning gibbous moon not too far away. By mid-month Pluto is rising by **0208** preceding sunrise at **0616**. By the 30th Pluto is rising at **0109** followed by sunrise at **0559**.

Asteroids:

- Still a dearth of asteroids. I searched for asteroids in 2021 with a reasonable magnitude; say less than or equal to +10 in April there is nothing except the regulars: Juno, Vesta, Hebe, Eros and Herculina. So consult your local planetarium software or try: <https://www.asteroidsnear.com/year?year=2021>

Meteors:

- **Lyrids** – Peak on April 21st to April 23rd See Highlights above for more details. (SeaSky.org) (American Meteor Society)

Comets: come in various classifications:

- 1) Short Period comets – further broken down into:
 - Halley Type: The Halley Types are believed to come from the Kuiper Belt and have periods in excess of 20-years.
 - Jupiter Type: The Jupiter types have a period less than or equal to 20-years.
 - Short period comets April have a near circular orbit or an elliptical orbit. The latter being far more common.
- 2) Long Period comets – thought to originate from the Oort cloud these comets have periods of over 200 years and have random inclinations around the celestial sphere.

Nothing really available this month in comets, perhaps something in May.

Deep Sky:

Notes:

L/Z abbreviation for ALT/AZ

R/D abbreviation for Right Ascension/Declination

α is right ascension

δ is declination

In each case, unless otherwise noted, you should look for the following on or about the 15th Day of April 2021 at 2100 PDT and you will have about 20 minutes of viewing time total.

Its galaxy season and The Virgo Diamond is high in the sky so lets look for some familiar objects:

- o **UGC 3697:**



Adam Block/[Mount Lemmon SkyCenter](#)/University of Arizona

The Integral Sign Galaxy is an edge-on spiral galaxy with a bit-of-a-twist. The warping is distinct in both the stellar and gaseous disks. In most spiral galaxies the concentration of Neutral Hydrogen is found in the center of the galaxy but not UGC 3697. Then NH is found along the western edge instead. This is a challenging target because of the two bright orange stars located in the same field of view (only one is visible above).

o IC 2574:



By ESA/Hubble & NASA -

<http://www.spacetelescope.org/images/potw1152a/>, CC BY 3.0,

<https://commons.wikimedia.org/w/index.php?curid=18018017>

IC 2574, also known as Coddington's Nebula, is a dwarf spiral galaxy discovered by American astronomer [Edwin Foster Coddington](#) in 1898. Located in Ursa Major, a constellation in the northern sky, it is an outlying member of the M81 Group. It is believed that 90% of its mass is in the form of dark matter. ([Wikipedia](#))

April is great for both viewing and imaging. Spend some time outside with your scope. Spring is here.

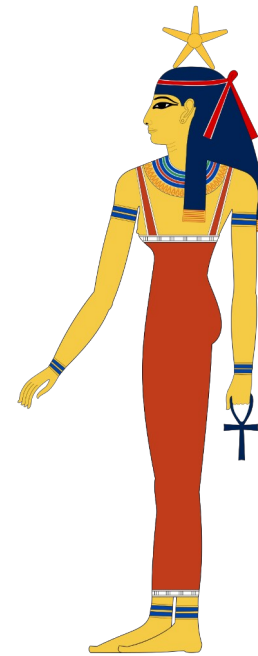
For now – Keep looking up.



Random Thoughts – Stars – How did they get their names?

by Chuck Dyson

There are about twenty tombs in Egypt that have star themes or star maps on their ceilings and walls. Of these tombs the one constructed for an individual named [Senemut](#) around 1470 BC, but never finished, has as its central motif the Egyptian Celestial diagram (a star based calendar). Several constellations are recognizable in the display along with star patterns and individual stars that are named, Prominent among the Egyptian named stars is [Sopdet](#) this translates to Scorcher and later morphs into the Greek word Sothis and even later (about two thousand years later) becomes Sirius with the modern meaning of burning brightly. The appearance of Sopdet the Scorcher was important to the Egyptians as it heralded the start of the rainy season and that was the start of a new agricultural year. Despite the rich display of astronomical lore and actual astronomical understanding in several tombs two early and highly respected British archaeologists declared that the study of Egyptian astronomy was unlikely to produce either a PhD or publications in respected journals and this opinion put a lid on the academic research into Egyptian astronomy until the 1950's. In 1998 things really changed with the discovery of a Neolithic stone structure in [Nabta Playa](#) in the Aswan dam area that was dated to between 7,500 and 5,500 BC (Stonehenge is dated from about 3,100 BC). Although there is some question on whether this site was just a ceremonial gathering place or a gathering place and a celestial calendar site, it does give the Egyptians a huge astronomical head start on most other civilizations and puts them head to head with the Sumerians and Babylonians.



*Sopdet in red dress,
with star on her head
([Wikipedia](#))*

Why don't we have more stars with Egyptian names? Until the age of enlightenment, the 1700's, astronomers principal jobs were 1) align Pharaoh's and noble's tombs with the stars that were important for the afterlife, 2) cast horoscopes on weather, best times to go to war, pending disasters, the usual stuff, and [theurgic](#) divination - the process of helping the soul unite with the divine and 3) create star charts that could possibly be of some use to people. Egyptian astronomy sort of only worked with Egyptian gods and for Egyptian ideals not to mention that hieroglyphs as a written language died out completely by 400 AD. As more efficient alphabets came into use, the names of Egyptian stars were lost and forgotten.

As the Egyptian empire was starting to struggle, a young Greek king woke up in Macedonia one day and said to himself "I think I'll just go out and conquer the world today" and Alexander did just that. Although we call Alexander a Greek, technically he was not. He was, in fact, Macedonian but because his tutor was Aristotle and he had been taught to appreciate and emulate all things Greek. Alexander's big thing, aside from conquering maybe half of the known world, was to treat the conquered nations fairly and with respect for their cultures. Alexander's plan for doing this was to start out as [good cop](#)/bad cop; bad cop - you resist and your city is



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leveled and you are sold into slavery, gotta pay for this war some way; good cop - you surrender and you are "free" people under the new regime and we repair the damage we caused to your city. After a few cities go up in smoke the choice gets kind of easy.

After conquering most of the world, Alexander promptly dies and his principal generals promptly go to war with each other to determine exactly who is the "rightful" inheritor of this empire. After only 20 or so years of war, the kingdom is divided up into four major areas with General Ptolemy declaring himself the King of Egypt and Palestine.

Ptolemy started an "All Things Greek" project - a new city, and another such project, in the form of a library. At this time a library was not necessarily a public library but a center of research because all books were handwritten and both rare and expensive. This library is reputed to have become the greatest library and university/think tank of its time. I must say reputed because no solid archaeological evidence, in the form of building, remains to show that the library ever existed. There are plenty of written witness accounts of the library and its function. Because of the plethora of written accounts, I will refer to the library as the Great Library of Alexandria and assume that it really existed.

The Great Library was setup to become the place where the entire knowledge of the world was located and a meeting and research center for the natural philosophers of the time. The term scientist did not come into existence until around 1830. Prior to that time math, physics, chemistry, biology, and astronomy were called natural philosophies and natural philosophers were those who studied the natural world.

What the Greeks brought to the Great Library was the astrolabe. The astrolabe was an instrument that would accurately measure the elevation of a star over the horizon. This with other instruments that could measure the angular separation between stars will permit people to create accurate and reproducible star maps. These maps helped sailors sail out of sight of land, with their own astrolabe on board, and still have some idea as to where they were. As sea trade was a major wealth builder of nations, the star maps were a huge deal. The great library lasted from around 300 BC to around 400 AD.

In the beginning there were just the Greek and the Egyptian cultures to deal with and the Greeks were inclined to be inclusive and accepting of other cultures. As time went on, the Romans showed up, the Christians showed up, and the [Quraysh](#) showed up - this was the major Arabic religion before Islam. Tolerance went out the window, so to speak, and each sect tried to reduce and destroy the works of the other sects. By 400 AD through various violent actions by different groups much of the library had been burned or had its contents looted and the final straw, that there is at least some written account of, was the killing of [Hypatia](#), a Greek pagan, by a Christian mob.

After the killing of Hypatia the written accounts of the Great Library of Alexandria come to a halt. Hypatia was not killed until after she had made several improvements to the design and function to the astrolabe. This could be considered as strong evidence that the Library scholars were actively pursuing astronomical studies and stellar mapping.



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Why do we have so few stars with Greek origin names? Much of the work done at the Great Library may have been destroyed by the different mobs. Remember all documents were hand copied so there weren't multiple copies of each work in existence. If you burnt the only copy then the information in it was gone.

Where do we go from here in our search for star names? You saddle up the camel and I will saddle up the Arabian mare (having ridden both of these animals I much prefer the Arabian) and we are off to Baghdad.

The Roman Empire that had been in decline was finally completely extinguished by 480 AD. What this meant to Western Civilization can be illustrated by Paris, France. When the Romans pulled out of Paris, the population was estimated at around 80,000 people. A few years later after local lords had fought each other for control of the area and several Viking groups had traveled up the Seine to help out with the slaughter and pillage, the population was estimated to be 10,000 to 20,000. Western Europe: welcome to the dark ages.

As the lights were going out in Europe they were being lit in the Arab world and by 930 AD Baghdad is estimated to have a population of one million. The Arabic world not only embraced the knowledge of the Greek and Roman empires but greatly expanded on it. Taking a lesson from Ptolemy, [Al-Mansur](#), the big daddy of Baghdad, established the House of Wisdom in 764 AD. In this new [mecca](#) of higher learning they developed algebra and made huge improvements on the astrolabe and finally they translated every written work into the Arabic language. At this point in time if you wanted reliable star charts for navigation or for casting someone's horoscope, you got a translated Arabic chart. When you translate something and there is a name of an object in it you can either rename the object into the language that you are translating to or transliterate, that is to keep the original name of the object but phonetically spell it in the language you are translating to. An example is [Zubenelgenubi](#) is the transliteration of az-zuban al-januubiyy - its meaning is the southern claw and it is a star in Libra but formally a part of the constellation of Scorpius.

In 711 AD the now Muslim Moors having conquered all of North Africa decided to cross the straight of Gibraltar and call Spain home. The Spanish were not thrilled, but what they got from the Moors was some really great palaces and gardens and the translated works of the Greeks and Romans with the Arabic transliteration of the star names.

After a long series of negotiations, with swords drawn, the Moors were finally pushed out of Spain in 1492 but the star charts remained. The new ruling nobles of Spain, a couple named Ferdinand and Isabella, suddenly realized that they would probably not be able to have Spanish caravans go through the Moorish empire now to get the spices and silks that they wanted. No worries, now that they were not funding a war they had monies to give to a young adventurer to look for a passage to India by sailing West, can you guess who that was? This set off the Renaissance, the age of Enlightenment, and the age of Reason with absolutely everybody using Arabic star charts.

Cheers, Chuck



Watch the Lion: Celestial Wonders in Leo by David Prosper

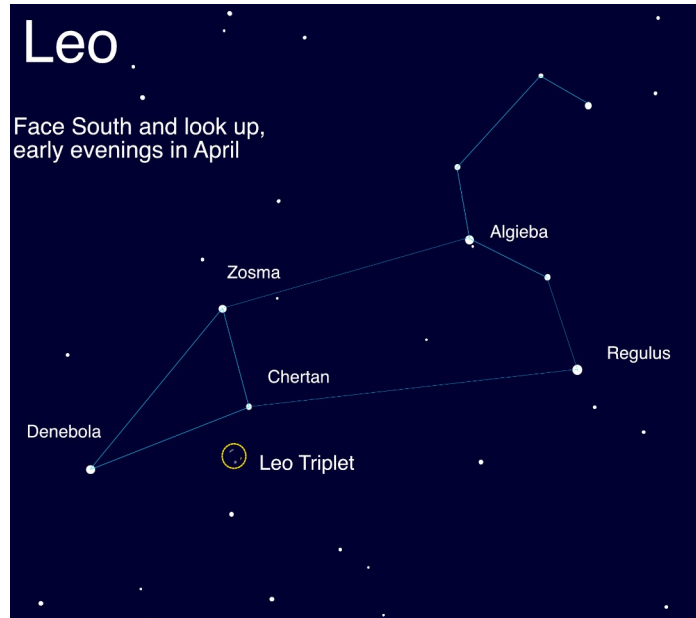
Leo is a prominent sight for stargazers in April. Its famous sickle, punctuated by the bright star Regulus, draws many a beginning stargazer's eyes, inviting deeper looks into some of Leo's celestial delights, including a great double star and a famous galactic trio.

Leo's distinctive forward sickle, or "reverse question mark," is easy to spot as it climbs the skies in the southeast after sunset. If you are having a difficult time spotting the sickle, look for bright Sirius and Procyon - featured in last month's article - and complete a triangle by drawing two lines to the east, joining at the bright star Regulus, the "period" in the reverse question mark. Trailing them is a trio of bright stars forming an isosceles triangle, the brightest star in that formation named Denebola. Connecting these two patterns together forms the constellation of Leo the Lion, with the forward-facing sickle being the lion's head and mane, and the rear triangle its hindquarters. Can you see this mighty feline? It might help to imagine Leo proudly sitting up and staring straight ahead, like a celestial Sphinx.

If you peer deeper into Leo with a small telescope or binoculars, you'll find a notable double star! Look in the sickle of Leo for its second-brightest star, Algieba - also called Gamma Leonis. This star splits into two bright yellow stars with even a small magnification - you can make this "split" with binoculars, but it's more apparent with a telescope. Compare the color and intensity of these two stars - do you notice any differences? There are other multiple star systems in Leo - spend a few minutes scanning with your instrument of choice, and see what you discover.

One of the most famous sights in Leo is the "Leo Triplet": three galaxies that appear to be close together. They are indeed gravitationally bound to one another, around 30 million light years away! You'll need a telescope to spot them, and use an eyepiece with a wide field of view to see all three galaxies at once! Look below the star Chertan to find these galaxies. Compare and contrast the appearance of each galaxy - while they are all spiral galaxies, each one is tilted at different angles to our point of view! Do they all look like spiral galaxies to you?

April is Citizen Science Month, and there are some fun Leo-related activities you can participate in! If you enjoy comparing the Triplets, the "Galaxy Zoo" project (galaxyzoo.org) could use your eyes to help classify different galaxies from sky survey data! Looking at Leo itself can even help measure light pollution: the Globe at Night project (globeatnight.org) uses Leo as their target constellation for sky quality observations from the Northern Hemisphere for their April campaign, running from April 3-12. Find and participate in many more NASA community science programs at science.nasa.gov/citizenscience. Happy observing!



The stars of Leo: note that you may see more or fewer stars, depending on your sky quality. The brightness of the Leo Triplet has been exaggerated for the purposes of the illustration - you can't see them with your unaided eye.



Your view of the three galaxies in the Leo Triplet won't look as amazing as this image taken by the VLT Survey Telescope, unless you have a telescope with a mirror 8 feet or more in diameter! Still, even a small telescope will help your eyes pick up these three galaxies as "faint fuzzies": objects that seem blurry against a background of pinpoint stars. Let your eyes relax and experiment with observing these galaxies by looking slightly away from them, instead of looking directly at them; this is called averted vision, a handy technique that can help you see details in fainter, more nebulous objects.

Credit: ESO, INAF-VST, OmegaCAM; Acknowledgement: OmegaCen, Astro-WISE, Kapteyn I.



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This article is distributed by NASA Night Sky Network The Night Sky Network program supports astronomy clubs across the USA dedicated to astronomy outreach. Visit <https://nightsky.jpl.nasa.org> to find local clubs, events, and more!



The TVA is a member club of [The Astronomical League](#).

