Temecula Valley Astronomer

The monthly newsletter of the Temecula Valley Astronomers September 2023

Events: General Meeting, Monday, September 11, 2023, at the Ronald H. Roberts Temecula Library, Room B, 30600 Pauba Rd, and/or ZOOM, at 6:00 PM.

- **IFI & Gallery by Clark Williams**
- **Women in Astronomy: Giving Credit Where Credit is Due by Sharon Flemings**
- **Refreshments by TBA**
- **Star Parties at South Coast Winery every Friday evening in June.**
- **For upcoming school Star Parties check the Calendar on the web page.**

WHAT'S INSIDE THIS MONTH:

Send newsletter submissions to Sharon Smith <sas19502000@yahoo.com> by the 20th of the month for the next month's issue.

Congratulations, India!

Image Credit: ISRO
Chandrayaan-3 spacecraft lands near the **moon's** south pole on August 23, 2023

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 – September 2023
By Mark Baker

I find myself falling into the same habit as most of not giving Sol its just due and recognition… it is both the Life Giver and possesses the potential to bring Doom upon us as well.

This solar cycle has been as active as the last one was passive… we've already endured several "outages" to the electronic mediums that run our planet, and the worst is yet to come!!!

I am heartened that several of our members observe and image the Sun regularly and share those pictures with us frequently… I always smile when a "tiny" spot appears, knowing they are often many Earths in diameter and generate enough energy to totally wipe out our fragile media web if we endured a direct hit. Even small outputs would be dangerous if not for our protective magnetic field…

However, any and all of us can get real time perspectives of the Sun just by going online to the Solar Dynamics Observatory and it covers at least a dozen different wavelengths… it includes data links, "movies", and transcribed data for reference.

If you want "up close and personal" information, you can tap into the NASA Parker Solar Probe and ESA's Solar Orbiter websites for other forms of real time information and data.

Sol is alive and well and getting ready to show off a bit so checking in on it occasionally may just be in your best interests…

In the meantime, we can prepare for the upcoming eclipses, Annular and Total, and learn more of what makes our nearest star tick… but if you do Look Up, remember that proper eye protection is a must!!! Share the word…

Clear, Dark Skies my Friends…

Looking Up Redux – September 2023

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
StarParty App (1.0.14)
FullAndNewMoon App (2.0)
Starry Night Pro Plus 8 (8.1.1.2078)
SkySafari 6 Pro (6.8.2)
Stellarium (23.1)
timeanddate.com/astronomy
https://www.fourmilab.ch/earthview/pacalc.html

ALL TIMES ARE LOCAL PACIFIC TIME (PST / PDT) 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)
yyyymmddThhmmss (Full date as: year month day Time separator hours minutes seconds)

Moon Phases for the month by date:

Friday	**the 29th**	**@0258 FULL in CETUS**
Wednesday	**the 6th**	**@1522 THIRD QTR in TAURUS+**
Thursday	**the 14th**	**@1056 NEW in LEO**
Friday	**the 22nd**	**@1233 First QTR in SAGITTARIUS**

Sep 12 15:44 406288 km - N-2d 9h Sep 28 1:06 359910 km F-1d 8h
Perigee comes on 2023-09-28 @ **0106** – **359,910 km (223,68 mi)**
Apogee comes on 2023-09-12 @ **1544** – **406,288 km (252,456 mi)**

2023 has: (12) new moons, (12) 1st Qtr moons, (13) Full moons, (12) 3rd Qtr moons
(1) Blue moon and (0) Black moons

Daylight Savings: Starts: 2023-Mar-12 : Ends: 2023-Nov-05 (CA does not keep PDT year-round)

Luna: Luna is waning gibbous on the first of the month, headed for Full on the 29th rising at **2034**, transiting at **0256**+ and setting by **0919**+. Luna by mid-month is NEW. Rising at **0701** and transiting at **1316**

setting at **1928**. By the-end-of-the-month Luna is waning gibbous, 99% illuminated, rising at **19001**-- transiting at **0130** and setting by **0804**.

Month At a Glance (distilled from**: SeaSky.org** and **Clark's planetary Orrey** program[s]**)**

September 15 - New Moon. The Moon will located on the same side of the Earth as the Sun and will not be visible in the night sky. This phase occurs at 01:41 UTC. 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.

September 19 - Neptune at Opposition. The blue giant planet will be at its closest approach to Earth and its face will be fully illuminated by the Sun. It will be brighter than any other time of the year and will be visible all night long. This is the best time to view and photograph Neptune. Due to its extreme distance from Earth, it will only appear as a tiny blue dot in all but the most powerful telescopes.

September 22 - Mercury at Greatest Western Elongation. The planet Mercury reaches greatest western elongation of 17.9 degrees from the Sun. This is the best time to view Mercury since it will be at its highest point above the horizon in the morning sky. Look for the planet low in the eastern sky just before sunrise.

September 23 - September Equinox. The September equinox occurs at 06:43 UTC. The Sun will shine directly on the equator and there will be nearly equal amounts of day and night throughout the world. This is also the first day of fall (autumnal equinox) in the Northern Hemisphere and the first day of spring (vernal equinox) in the Southern Hemisphere.

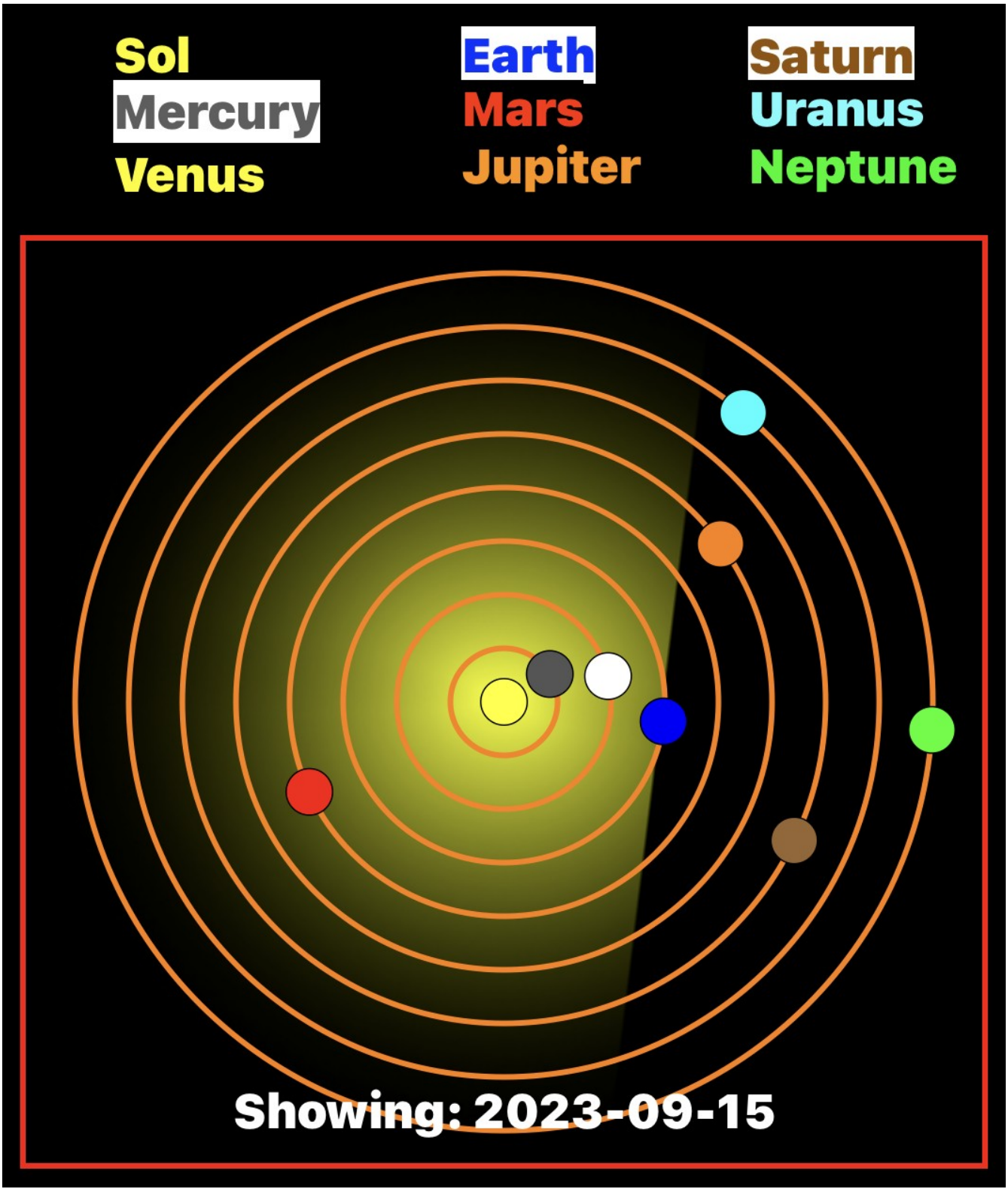
September 29 - Full Moon, Supermoon. The Moon will be located on the opposite side of the Earth as the Sun and its face will be will be fully illuminated. This phase occurs at 09:59 UTC. This full moon was known by early Native American tribes as the Corn Moon because the corn is harvested around this time of year. This moon is also known as the Harvest Moon. The Harvest Moon is the full moon that occurs closest to the September equinox each year. This is also the last of four supermoons for 2023. The Moon will be near its closest approach to the Earth and may look slightly larger and brighter than usual.September 15 - New Moon. The Moon will located on the same side of the Earth as the Sun and will not be visible in the night sky. This phase occurs at 01:41 UTC. 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.

Algol minima: (All times Pacific Time)

09/02/2023	**1409**
09/05/2023	**1058**
09/08/2023	**0746**
09/11/2023	**0435**
09/14/2023	**0123**
09/16/2023	**2212**
09/19/2023	**1901**
09/22/2023	**1549**
09/25/2023	**1238**
09/28/2023	**2127**


01 WAN GIB
02 WAN GIB
03 WAN GIB
04 WAN GIB
05 WAN GIB
06 3rd QTR
07 WAN CRSN
08 WAN CRSN
09 WAN CRSN
10 WAN CRSN
11 WAN CRSN
12 WAN CRSN
13 WAN CRSN
14 NEW
15 WAX CRSN
16 WAX CRSN
17 WAX CRSN
18 WAX CRSN
19 WAX CRSN
20 WAX CRSN
21 WAX CRSN
22 1st QTR
23 WAX GIB
24 WAX GIB
25 WAX GIB
26 WAX GIB
27 WAX GIB
28 WAX GIB
29 FULL
30 WAX GIB
2023 September

Planets:
Planetary Positions September 2023: (from TVA App iOS version)



- **Mercury:** Mercury in the beginning of the month is lost to the Sun. Mercury by mid-month is a morning object. Mercury rises at **0526**, transits at **1148** and sets by **1810**. Still a morning object on the 30th Mercury rises at **0532**, transits at **1148** and sets at **1803**.
- **Venus:** Is the Morning Star on the first of the month. Venus rises at **0428**, transits at **1057** and sets at **1726**. Venus is 11% illuminated and has an apparent magnitude of -4.42. By mid-month Venus remains the Morning Star rising at **0340**, transiting at **1013** and seting by **1640**. By end of month the Morning Star rises at **0319**, transits at **0951** and sets at **1622**.
- **Mars:** Mars is an evening object on the first of the month. Mars rises at **2326**, transits at **0625**+ and sets by **1325**+. By mid-month Mars is rising at **2256**, transits at **0559**+ and doesn't set until **1302**+**.** End-of-month finds the Warrior rising at **2219** transiting at **0525**+ and setting at **1232**+.
- **Jupiter:** Jupiter is a evening object on the first of the month. Jupiter rises at **2025**, transits at **0230**+ and sets at **0835**+. By mid-month Jove as a morning object rises at **1925**, transits at **0129**+ and sets at **0732**+. Come the end-of-month Jupiter rises at **1821**, transits at **0022**+ and sets at **0623**+.
- **Saturn:** Saturn is an evening object on the first of the month rising at **1818**, transiting at **2336** and setting at **0456**+. Saturn by mid month rises by **1720**, transiting at **2238** and setting at **0355**+. By the end-of-the-month Saturn rises by **0619**, transits at **2136** and set at **0253**+.
- **Uranus:** On the first of the month Uranus is an evening object rising at **2219**, transiting at **0508**+ and setting at **1157**+. By the ides Uranus is rising at **2124**, transiting at **0412**+ and setting by **1101**+. End-of-month finds Uranus as a evening object rising at **2023**, transiting at **0312**+ and setting at **1000**+.
- **Neptune:** Neptune in the beginning of the month is an evening object. Neptune rises at **1951**, transits at **0144**+ and sets by **0737**+. By the 15th Neptune rise at **1855**, transits at **0048**+ and sets by **0640**+. By the end of the month Neptune is rising at **1755**, transiting at **2347** and set by **0539**+.
- **Pluto:** Pluto on the first of the month is an evening object rising at **1702**, transiting at **0012**+. and setting at **0509**+. By mid-month Pluto is rising by **1606**, transiting by **2103** and sets by **0159**+. By the 30th Pluto is rising at **1507** transits at **2003** and sets at **0100**+.

Asteroids:

- Still a dearth of asteroids. I searched for asteroids in 2023 with a reasonable magnitude; say less than or equal to +10 in September there is nothing except the regulars: Juno, Vesta. Hebe, Eros and Herculina. So consult your local planetarium software or try: https://www.asteroids near.com/year?year=2023

Meteors:

- September 12, 13 - Perseids Meteor Shower (see Highlights above).

Comets: come in various classifications:

- 1) Short Period comets – further broken down into:
  - Halley Type: The Halley Types are believe 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 September 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.

103P/Hartley is a 9th magnitude comet in Andromeda. Its orbit caries it around the Sun about every 6.5 years aat about 3.5 AU.

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 September 2023 at 2100 PDT and you will have about 20 minutes of viewing time total.

Lets take a look at some favorite summer objects:

- IC 1318 A/B**:**

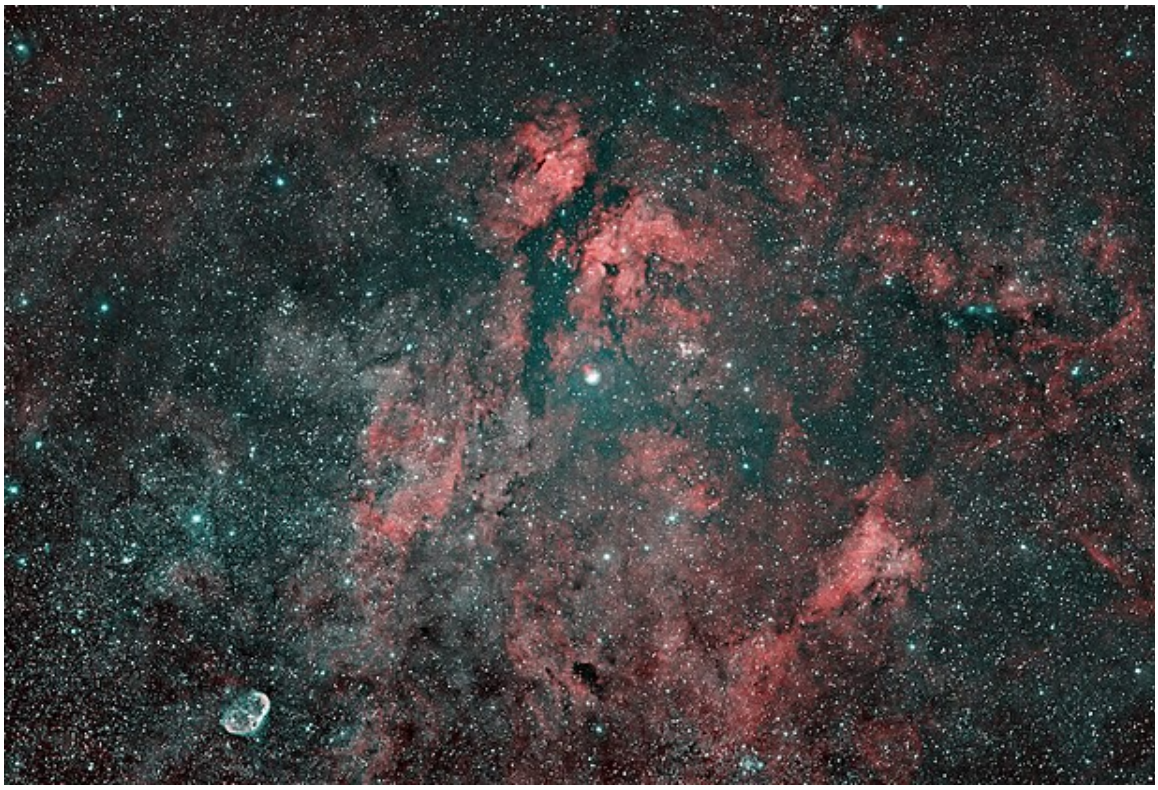


Illustration 1: By Erik Larsen - https://www.flickr.com/photos/31986095@N05/5183823288/, CC BY 2.0, https://commons.wikimedia.org/w/index.php?curid=12100647

The Sadr Region (also known as IC 1318 or the Gamma Cygni Nebula) is the diffuse emission nebula

surrounding Sadr (γ Cygni) at the center of Cygnus's cross. The Sadr Region is one of the surrounding nebulous regions; others include the Butterfly Nebula and the Crescent Nebula. It contains many dark nebulae in addition to the emission diffuse nebulae.

Sadr itself has approximately a magnitude of 2.2. The nebulous regions around the region are also fairly bright.like structures and distinct layers of material, with a bright and enclosed central bubble surrounded by a larger, more diffuse cloud. (Wikipedia)

- **NGC 6946:**

Illustration 2: By Renseb at English Wikipedia - Transferred from en.wikipedia to Commons by Liftarn using CommonsHelper., Public Domain, https://commons.wikimedia.org/w/index.php?curid=4488913

NGC 6946, sometimes referred to as the Fireworks Galaxy, is a face-on intermediate spiral galaxy with a small bright nucleus, whose location in the sky straddles the boundary between the northern constellations of Cepheus and Cygnus. Its distance from Earth is about 25.2 million light-years or 7.72 megaparsecs, similar to the distance of M101 (NGC 5457) in the constellation Ursa Major. Both were once considered to be part of the Local Group, but are now known to be among the dozen bright spiral galaxies near the Milky Way but beyond the confines of the Local Group. NGC 6946 lies within the Virgo Supercluster.

The galaxy was discovered by William Herschel on 9 September 1798. Based on an estimation by the Third Reference Catalogue of Bright Galaxies (RC3) in 1991, the galaxy has a D25 B-band isophotal diameter of 26.77 kiloparsecs (87,300 light-years). It is heavily obscured by interstellar matter due to its location close to the galactic plane of the Milky Way. Due to its prodigious star formation it has been classified as an active starburst galaxy. NGC 6946 has also been classified as a double-barred spiral galaxy, with the inner, smaller bar presumably responsible for funneling gas into its center.

Various unusual celestial objects have been observed within NGC 6946. This includes the so-called 'Red Ellipse' along one of the northern arms that looks like a super-bubble or very large supernova remnant, and which may have been formed by an open cluster containing massive stars. There are also two regions of unusual dark lanes of nebulosity, while within the spiral arms several regions appear devoid of stars and gaseous hydrogen, some spanning up to two kiloparsecs across. A third peculiar object, discovered in 1967, is now known as "Hodge's Complex". This was once thought to be a young supergiant cluster, but in 2017 it was conjectured to be an interacting dwarf galaxy superimposed on NGC 6946. (Wikipedia)

September is great for both viewing and imaging. Spend some time outside with your scope. Summer is fading and Autumn is coming!

For now – Keep looking up.

RANDOM THOUGHT September 2023
By Chuck Dyson

AURORA!

Having successfully passed my 78th birthday and being aware that the average life expectancy of males in the US is 73.6 years, doing the things that are on my "bucket list" has become a rather serious matter for me. It appears that time is definitely not on my side.

As an avid amateur astronomer it almost goes without saying that seeing the Aurora Borealis is sitting almost at the top of that list. Living my entire life, so far, in Southern California means that my opportunities to observe aurora have been EXTREMLY limited; but are not zero. The easy solution to my aurora conundrum would be to schedule a trip to Alaska but my wife has a very sever snow allergy and will only go to Alaska in summer.

So, the questions are: How are aurora created? What are aurora? When can we see them from Southern California?

The Sun is not a solid body but a ball, albeit a very large ball to be sure, of gas composed mostly of Hydrogen and Helium. In the center 20% the pressure and temperature are high enough to directly fuse 600 million tons of Hydrogen into 596 million tons of Helium per second and in the process transform 4 million tons of matter into energy (photons) each second. This energy is what heats the Sun and eventually leaves the surface as photons of light. On their way to the solar surface the photons work their way through the convection zone of the Sun and where all of the atoms in this area are ionized (missing or having extra electrons) or in a plasma state (all electrons stripped off of the nucleus). Because of the large blobs of charged particles (our atoms in a ionized or plasma state) giant magnetic fields are formed. Because the Sun is a gas ball it has different speeds of rotation from the pole to the equator; with the pole rotating once every 38 days and the equator rotating every 26 days. This differential rotation bends, folds, and generally mangles the magnetic field lines (see Fig. #1).

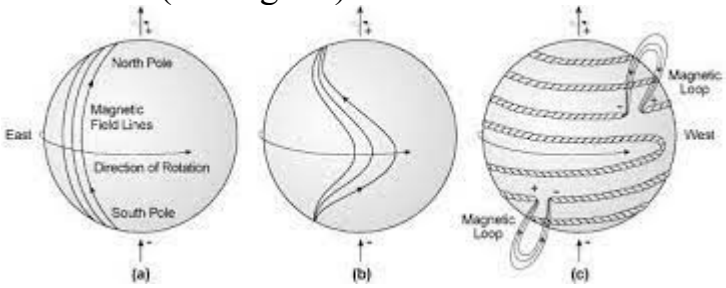


Figure 1

The Sun's generally chaotic electrical field contrasts with Earth's generally organized electrical field (see Fig. #2).

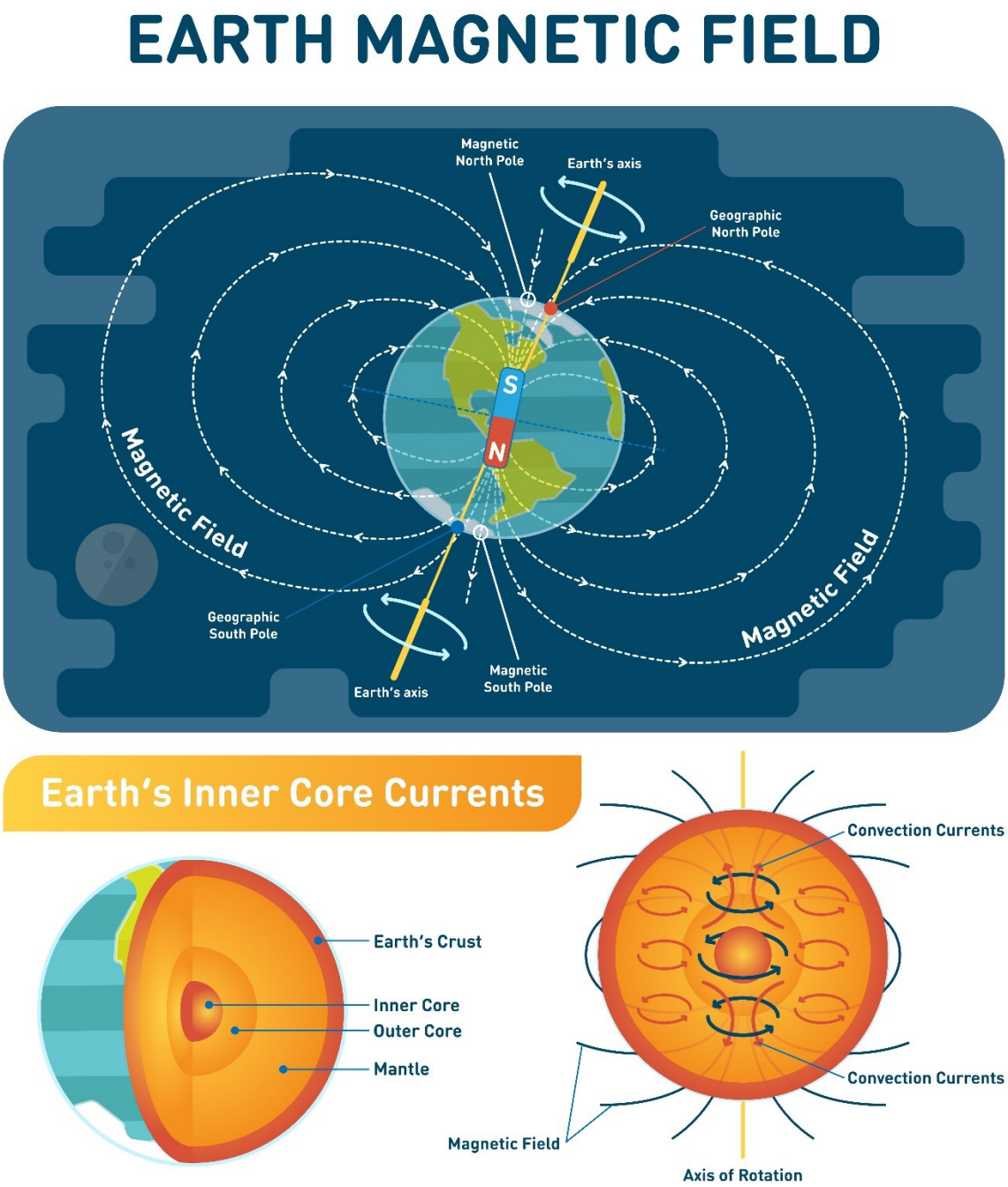


Figure 2

As the Earth is a solid body all parts have the same rotational period so our magnetic field resembles a classic field generated by a bar magnet.

The Sun spits out a steady stream of plasma particles, about 1.5 million tons per second; however, only 0.00000005% of these particles are aimed at the Earth and its magnetic field. When this stream of plasma particles hit the Earth's magnetic field they spiral down the lines of magnetic force, gaining kinetic energy until they hit a molecule in the extreme upper atmosphere, 62 to 310 miles up. When a plasma particle smacks an atmospheric molecule it transfers energy to it and if it is just the right amount of energy an electron in the molecule will jump up to a higher electron orbit around the molecule and then will jump back to its original orbit and this will result in the molecule emitting light. Because our atmosphere is 78% nitrogen (N2) and 21% oxygen (O2) the colors you see are blue and purple from (N2) and green and red from (O2). If the Sun spits out these particles every single day do we get auroral displays every day? No, at least not ones that you can see. The auroral displays that we can see come from large electrical events on the surface of the Sun. Because the Sun's magnetic lines get twisted up they will occasionally collapse upon themselves and release a large pulse of electrical energy. Unlike the solar wind that is released all over the surface of the Sun the pulses of energy are local streams of concentrated and directed energy. If the stream of energy misses the Earth we get no light show but if it hits Earth we get a light show. The energy releases occur in two flavors. The solar flare that is a small solar "burp" of energy that sweeps up particles before it and then slams them into the Earth's magnetic field and the coronal mass ejection (CME) that is a massive solar "belch" that blasts out both a magnetic and particle stream that just hammers the Earth's magnetic field (see Fig. #3).

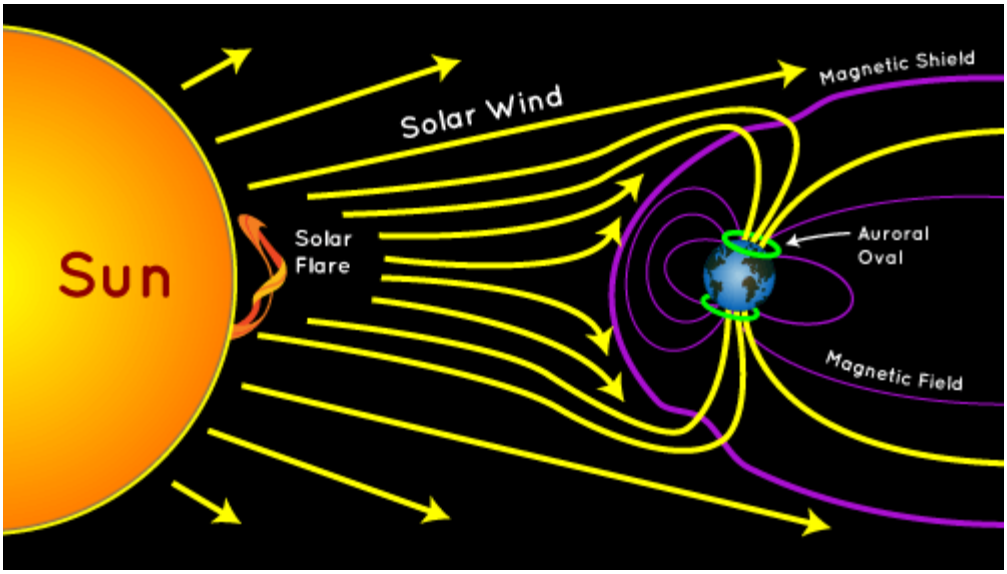


Figure 3

In Fig. #3 the Earth's magnetic shield is where the Earth's magnetic field strength is stronger than the Sun's and solar particles and magnetic fields are normally deflected away from the Earth but a solar burp/belch will distort and overwhelm our shield and large numbers of plasma particles will travel down our magnetic lines, at both poles, and create really bright auroral displays.

On the night of April 15 2023 people as far south as Chino, California were able to capture pictures of an aurora on their cellphones and several TV stations also captured videos of the aurora and it was on the news. Last, but not least, the Mt. Wilson solar tower weather cam captured a few seconds of the aurora. So where do you go to get information on the possibility of seeing an aurora on any given night. First things first, do not look for any long term aurora forecasts because solar ejections take from 14 hours to seven days to travel to Earth, also do not get too excited about seeing aurora on nights with a full moon as it tends to wash out the aurora. Finally your best chance of seeing an aurora is during a period of solar maximum when there are lots of sunspots. The National Oceanic and Atmospheric Administration (NOAA) publishes graphs of the expected aurora oval (see Fig. #4).

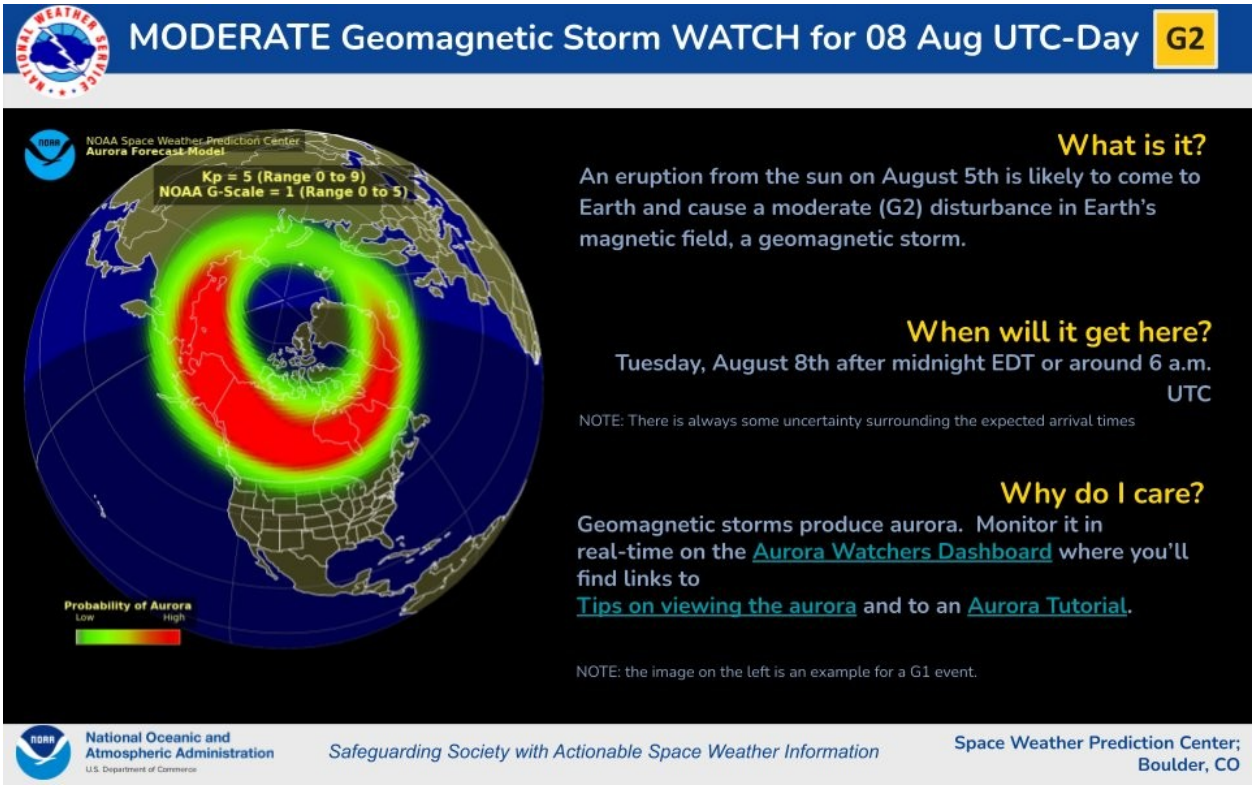


Figure 4

Especially helpful is the graph of the Aurora view line for tonight and tomorrow night. Good luck and good, aurora, hunting.

Where is the best place to see aurora? Remember aurora occur from 62 to 310 miles up in the atmosphere. The International Space Station orbits at 250 miles up; so, from the space station you can look up at aurora straight out at aurora and down at aurora, best show on the planet.

Cheers Chuck

Another Look September 2023
By Dave Phelps

Lyra

September 15 - New Moon. September 29 - Full Moon, Supermoon

Autumnal equinox occurs at 06:43 UTC on September 23. (2343hrs. 9/22/23 west coast time.)

The Harvest Moon is the full moon that occurs closest to the Autumnal equinox each year.

This full moon was known by early Native American tribes as the Corn Moon and the Harvest Moon.

Other Native American names are Autumn Moon, Rutting Moon and Mating Moon (Cree), Child Moon (Tlingit), Falling Leaves Moon (Ojibwe), Leaves Turning Moon (Anishinaabe),Moon of Brown Leaves (Lakota), Moon When the Rice is Laid Up to Dry (Dakota) and Yellow Leaf Moon (Assiniboine)

In French - Pleine Lune de Septembre, in German - Vollmond im September, in Spanish - Luna llena de Septiembre and in Greek - πανσέληνος Σεπτεμβρίου i.e Pansélinos Septembríou

Lunar close approach to Antares this month. An occultation will occur over the western pacific.

I have found no constellation with as much written imagery as Lyra. From Sappho and Pindar at some 500 or 600 BC up through Shakespeare, the Lyre was honored as magical and as the precursor of the stringed instrument, from the original tortoise shell with seven strings representing the Pleiades to our modern day Welsh and Irish Harps.

The Greeks seem to have confused the stories behind the harp, however, we may also be accused of telescoping history or maybe more literately historical myth.

As it begins, the Lyre was invented by Hermes who gifted to his half-brother Apollo. From there, the most famous of those associated with the Lyre is Orpheus, son of a Muse and a prince, or maybe Apollo. Orpheus was gifted the talent of music.

"Everything that heard him play,
Even the billows of the sea,
Hung their heads, and then lay by…"Shakespeare

Orpheus married Eurydice, who, depending on the legend, was frolicking with her maids at her wedding or running from a man who wished to do her harm; she stepped on or was bitten by a viper and died.
She went to Hades.

So Orpheus;
...and when determined to have his wife released from Hades he:
" E'en to the dark dominions of the night
He took his way, through forests void of light,
And dared amid the trembling ghosts to sing.
And stood before the inexorable king.
The infernal troops like passing shadows glide,
And listening, crowd the sweet musician's side;
Men, matrons, children, and the unmarried maid,
The mighty hero's more majestic shade,
And youth, on funeral piles before their parents laid.
E'en from tlie depths of hell the damn'd advance;
The infernal mansions, nodding, seem to dance;
The gaping three-mouth'd dog forgets to snarl;
The furies hearken, and their snakes uncurl;
Ixion, seems no more his pain to feel,
But leans attentive on his standing wheel.
All dangers past, at length the lonely bride
In safety goes, with her melodious guide." Virgil

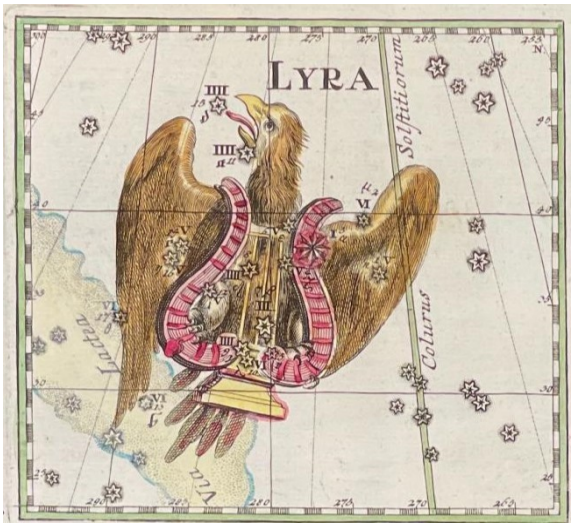
Alas, he was only human, he erred and he failed

As it aged the Arabs called Lyra "the Swooping Eagle," to distinguish it from Aquila, which was regarded as "the Flying Eagle. The Persian also called it Harp, but later, as national boundaries solidified, we find that the Bohemians called it The Fiddle, Teutons Harapha, and the Anglo-Saxons Hearpe. Britons named it Arthur's Harp, the Egyptians Vulture, then came the Christians.

Also, Lyra is the "Stone Eagle of the Desert," which shows the bird with half-closed wings versus the outspread wings of Cygnus and the aforementioned Aquila.

The lyre had multicolored identities to go with its multicultural legacy. It was a Ram, a Mule, a tripod, a bowl, and a scroll. Many cultures considered it Avian. Most commonly an Eagle or a Vulture as is shown on some globes. The bird reference is even found in Australia where to the aboriginal, Lyra was called Neilloan and represented a ground dwelling bird. Lyra was known as Urcuchillay by the Incas and was worshiped as an animal deity.

Returning to the invention of the Lyre by Hermes, the story tells of him finding a dried tortoise shell on the shore of the sea, with its tendons stretched across. This allusion stayed with the Greeks and Arabs who referred to the constellation as Testudo; in Spanish Galapago orTesta.
The symbiosis of the Greek and the Arab is seldom seen better than in the constellation of the Lyre.



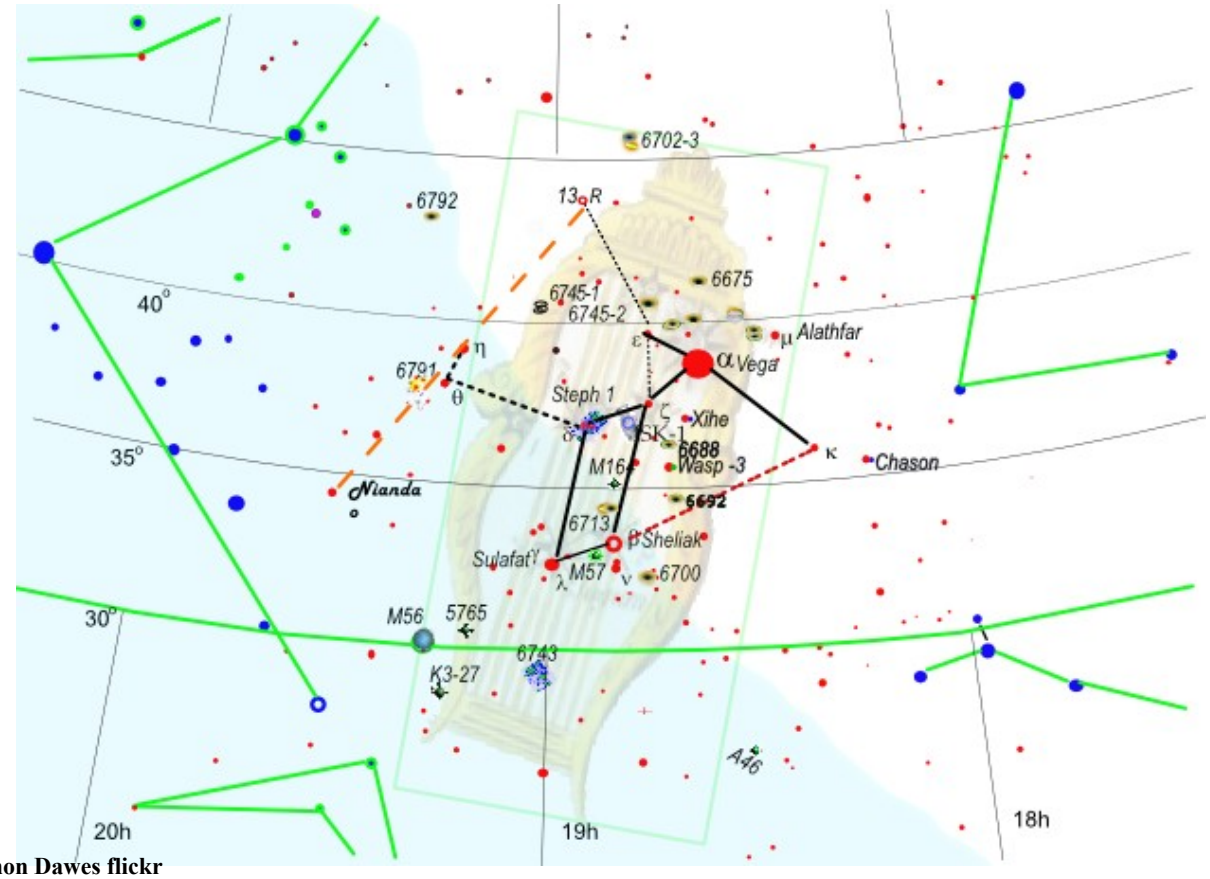
An alternate tale records Amphion, a son of Zeus and Antiope, built the walls of Thebes with the help of his twin brother, Zethus. To move the heavy stone he started singing and playing the Lyre. The stones began to follow him, transported by his voice and the music of the Lyre.

Four and five thousand years ago in the Euphrates valley, a goat and a dog where placed in the sky where Lyra and Hercules are now. These were almost certainly identified as special to the goddess Gula.
Mercurii philosophici firmamentum firmianum Corbinian Thomas
In its history, the asterism has been almost universally described as a bird or a musical instrument.

“For Orpheus' lute was strung with poet's sinews ;
Whose golden touch could soften steel and stone,
Made tigers tame, and huge leviathans
Forsake unsounded deeps to dance on sands.”

“I saw with its celestial keys,
Its chords of air, its frets of fire,
The Samian's great iEolian lyre
Rising through all its sevenfold bars
From earth into the fixed stars”
The Occultation of Orion Longfellow

The Chinese also have a rich relationship with Lyra. She has lovers, working girls, a bureau of standards and, as I drew on the chart, Niandao, a route the Emperor chose while moving between palaces. **(Ian Ridpath)**



Simon Dawes flickr

As it is rich in poetry, so is Lyra rich in astronomy. There is, for the amateur, over a hundred variable and multiple star systems. Lyra is rich in galaxies, planetaries, open star clusters, extraterrestrial planets, a corner of the milky way *"The graceful form, amid the lucid stream Of the fair Milky Way"* and a globular cluster.

Of all of these riches, however, the most looked at is M57, the Ring. Plenty has been written about it. How crisply can you resolve it? Have you seen the central star? How about the outer shell? Then there is the region around the ring.

Scott Houston wondered if you can find NGC's 6700 and 6713, two 13th magnitude galaxies near. He also wrote of IC 1296 and if anyone had ever seen it visually. It's a 15th magnitude barred spiral in the same wide field view of your eyepiece. The image by Bruce and Gayelee Waddingtonshows it beautifully.

www.astrobin.com/full/yfu2o9/0/

Equally as difficult will be NGC 6745 a&b. A pair, or triple?, of interacting galaxies with a distinctive bird's head shape. It's small, though, good luck.

Up near the top of Lyra are NGC's 6702 and 6703. Elliptical and Lenticular, they look somewhat alike. N6703 is about a mag. brighter than its cousin at 11th. The eastern side of Lyra is also hunting ground for NGC's 6688 and 6692 interesting galaxies in their own right. I am equally interested in large, sparse open clusters around Lyra. Steph 1, as opposed to Steph 2 in Scutum, is superimposed over delta δ Lyrae, a multiple star.

I have no information about Dr. Sofik Iskudarian, except that she is an astronomer at Byurakan Astrophysical Observatory in Armenia. She also has an open star cluster Isk 1,

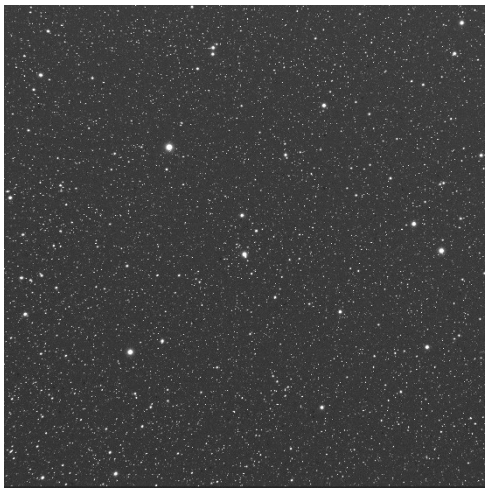
named after her near zeta, ζ. Its claim to fame is that its 110' in size. From the obscure to the sublime is N6791 over by theta, θ. 6791 is 10th magnitude and rather rich and a fairly good size.

Two more open clusters are ASCC101and N6743, though somewhat sparse as are most OC's. Both clusters will be visible in your finder.
www.coldphotons.com/zen_astro/astro_images/M57_HaLRGB_Final.jpg https://webda.physics.muni.cz/cgi-bin/ocl_page.cgi?dirname=ascc10L

Lyra also has interesting individual stars and planets. Vega is a close double, not related, but the contrast between 1st and 10th magnitude is difficult. Epsilon ε, is the double-double. R lyrae and T lyrae are variable stars. T is a carbon star and very red. Beta β, named Sheliak, is one of the brighter stars in Lyra. It is a six star system. How many can you see?
https://ocastronomers.org/wp-content/uploads/2018/12/M56-OCA.jpg

Named stars with planets are Wasp 3 with one planet, Kepler 37-3 planets, K102 is interesting. It has 5? Planets and two red dwarf companions. Can you imagine the sights you'd see standing on one of those planets? K138 is a 13th magnitude red dwarf with three or four planets and HD 173416 is named Xihe. Xihe, a sun goddess, is 6th magnitude and has one planet. Others are Hat-P-5 named Chason. Gliese 758 is a close 6th magnitude star with a "brown dwarf" companion. Gliese 747 is very red and 11th magnitude.

Historically named stars in Lyra are Vega α, relating to the swooping of an eagle. In modern Spain a vega is a large pasture or field. Aladfar η is a talon of that swooping eagle and Sulafat γ returns us to the shell of a tortoise.
https://www.flickr.com/search/?text=ngc 6743



We need not forget Lyra's lone globular, M56. You will need some glass to see it well. It is 9' across, but at 8th magnitude and quite loose and sparse, an "X", per Shapley-Sawyer, it will be a tough find in binoculars from your back yard.

There are a couple of planetary nebula in Lyra bright enough for us to see though none brighter than 13th magnitude. Close to M57, halfway to Vega is 13th magnitude Minkowski 1-64, a small cousin to its brighter neighbor. Then look for N6765, 13th magnitude and half a minute is size, the images show it to have an irregular shape. Kohoutek 3-27 is 15th magnitude and Abell 46 is 13th. Images of these object can be found on Astrobin.

Dark Skys
Dave Phelps

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Looking Beyond the Stars
By Brian Kruse

Looking up in awe at the night sky, the stars and planets pop out as bright points against a dark background. All of the stars that we see are nearby, within our own Milky Way Galaxy. And while the amount of stars visible from a dark sky location seems immense, the actual number is measurable only in the thousands. But what lies between the stars and why can't we see it? Both the Hubble telescope and the James Webb Space Telescope (Webb) have revealed that what appears as a dark background, even in our backyard telescopes, is populated with as many galaxies as there are stars in the Milky Way.

So, why is the night sky dark and not blazing with the light of all those distant galaxies? Much like looking into a dense forest where every line of sight has a tree, every direction we look in the sky has billions of stars with no vacant spots. Many philosophers and astronomers have considered this paradox. However, it has taken the name of Heinrich Wilhelm Olbers, an early 19th century German astronomer. Basically, Olbers Paradox asks why the night sky is dark if the Universe is infinitely old and static – there should be stars everywhere. The observable phenomenon of a dark sky leads us directly into the debate about the very nature of the Universe – is it eternal and static, or is it dynamic and evolving?

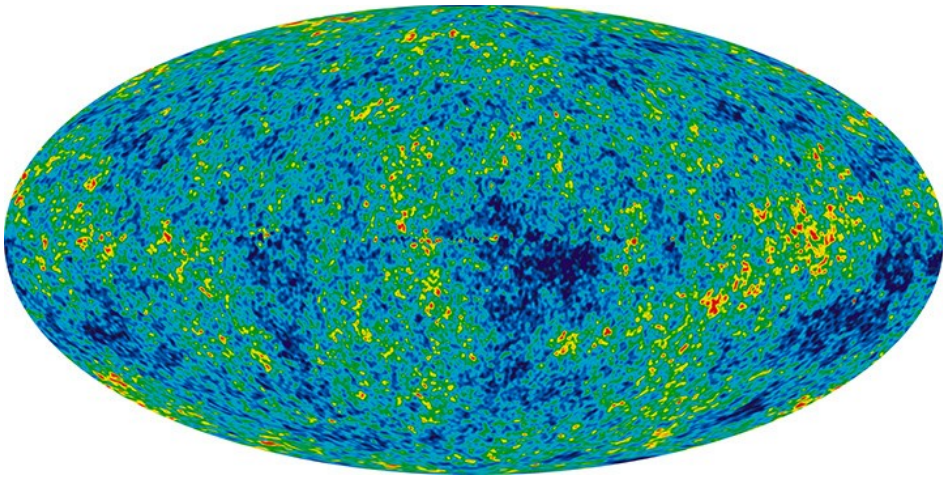
It was not until the 1960s with the discovery of the Cosmic Microwave Background that the debate was finally settled, though various lines of evidence for an evolving universe had built up over the previous half century. The equations of Einstein's General Theory of Relativity suggested a dynamic universe, not eternal and unchanging as previously thought. Edwin Hubble used the cosmic distance ladder discovered by Henrietta Swan Leavitt to show that distant galaxies are moving away from us – and the greater the distance, the faster they're moving away. Along with other evidence, this lead to the recognition of an evolving Universe.

The paradox has since been resolved, now that we understand that the Universe has a finite age and size, with the speed of light having a definite value. Here's what's happening – due to the expansion of the Universe, the light from the oldest, most distant galaxies is shifted towards the longer wavelengths of the electromagnetic spectrum. So the farther an object is

from us, the redder it appears. The Webb telescope is designed to detect light from distant objects in infrared light, beyond the visible spectrum. Other telescopes detect light at still longer wavelengths, where it is stretched into the radio and microwave portions of the spectrum. The farther back we look, the more things are shifted out of the visible, past the infrared, and all the way into the microwave wavelengths. If our eyes could see microwaves, we would behold a sky blazing with the light of the hot, young Universe – the Cosmic Microwave Background.

The next time you look up at the stars at night, turn your attention to the darkness between the stars, and ponder how you are seeing the result of a dynamic, evolving Universe.

NASA's James Webb Space Telescope has produced the deepest and sharpest infrared image of the distant universe to date. Known as Webb's First Deep Field, this image of galaxy cluster SMACS 0723 is overflowing with detail. This slice of the vast universe is approximately the size of a grain of sand held at arm's length by someone on the ground.
(Image Credit: NASA, ESA, CSA, STScI) https://bit.ly/webbdeep



The oldest light in the universe, called the cosmic microwave background, as observed by the Planck space telescope is shown in the oval sky map. An artist's concept of Planck is next to the map. The cosmic microwave background was imprinted on the sky when the universe was just 380,000 years old. It shows tiny temperature fluctuations that correspond to regions of slightly different densities, representing the seeds of all future structure: the stars and galaxies of today. (Image credit: ESA and the Planck Collaboration - D. Ducros)
https://go.nasa.gov/3qC4G5q

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