

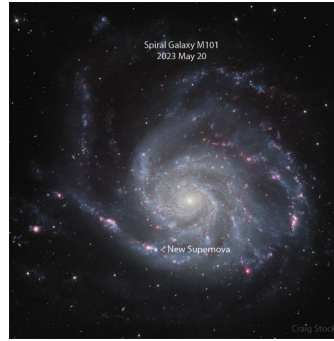


Temecula Valley Astronomer

The monthly newsletter of the Temecula Valley Astronomers June 2023

**Events: General Meeting,
Monday, June 5, 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
- Stellar Evolution and the Origin of Elements by Timothy Thompson
- 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](#).



Dubbed [SN 2023ixf](#)

Discovered by Japanese astronomer [Koichi Itagaki](#)

Occurred in the photogenic [Pinwheel Galaxy M101](#), about 21 million light years away
[Type II supernova](#),

Image Credit: [Craig Stocks & Utah Desert Remote Observations](#) www.utahdesertremote.com

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

Looking Up Redux

compiled by Clark Williams

Random Thought – Don't Row. Throw Your Oars Away!

by Chuck Dyson

Another Look

by Dave Phelps

NASA Night Sky Notes

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



Cosmic Comments – June 2023

By Mark Baker

One of the victims of the pandemic was Explore JPL... this event is very popular in SoCal as it gives people of all walks and ages an opportunity to “touch” real science in the making and in operation.

2020, 2021, and 2022 saw this inspirational setting canceled, so it was with great anticipation when it was announced it would resume in 2023...

Although the numbers were a bit shy of the 36,000 visitors that were anticipated, it was still a success in every way, shape, and form... and for the first time, defense was on display along with the usual science venues.

I was hoping to be on the Mars team again, but after the background check, it was deemed more important to have me work with the Near Earth Object team and talk planetary defense. And I couldn't have been better utilized...

We had the principle scientists and engineers of the upcoming NEO Surveyor mission present, and I was totally impressed at how they engaged each and every person that expressed interest or voiced a question. They were awesome...

As a NASA JPL ambassador, I am expected to engage, but who knew a bunch of “stuffy” staff members would be so enthusiastic... I profess now that they have the right people in the right positions when it comes to defending the planet through impact mitigation!!!

Throughout the weekend, we talked about a plethora of other topics that were of interest to the participants... NEO Wise, DART, OSIRIS Rex, were among the most popular topics of discussion. I even saw glimpses of anger when Arecibo was mentioned, or the dish in China that isn't being shared were brought up...

It was a great resumption of a great tradition, and I was so happy to see so many visitors that I know take the time and be informed of the good things being done in the world to prevent Dinosaur redux... and this was just at the Defense venue. I'm sure they were just as enthralled at all the science arenas as well...

And once again, TVA is a practicing partner of what JPL and other agencies strive for...we get people to Look Up!!! Keep up the good work...

Clear, Dark Skies my Friends...



Looking Up Redux – June 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

TVA App (2.0.1296)

FullAndNewMoon App (2.0)

Starry Night Pro Plus 7 (7.6.3.1373)

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:

Saturday the 3rd @2042 FULL in SCORPIUS

Saturday the 10th @1232 THIRD QTR in AQUARIUS

Saturday the 17th @0050 NEW in TAURUS

Monday the 26th @0823 First QTR in VIRGO

Jun 6 23:09 364859 km F+2d19h Jun 22 18:32 405384 km N+4d13h

Perigee comes on 2023-06-23 @ **2309** – 364,859 km (226,713 mi)

Apogee comes on 2023-06-22 @ **1832** – 405,384 km (251,894 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)



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Luna: Luna is waxing gibbous on the first of the month, headed for Full on the 6th rising at **1633**, transiting at **2211** and setting by **0348+**. Luna by mid-month is waning crescent at 7% illumination. Rising at **0334-** and transiting at **1046** setting at **1804**. By the-end-of-the-month Luna is waxing gibbous, 87% illuminated, rising at **1624** transiting at **2138** and setting by **0252+**.

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

June 1, 2 - Mars in the Beehive. The planet Mars will pass through the beehive cluster, an open cluster of stars located in the constellation Cancer. Mars can be seen in or very near the cluster on the nights of June 1st and 2nd. A good pair of binoculars should be enough to see this rare event all though a telescope will provide a much better view.

June 4 - Full Moon. 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 **2042**. This full moon was known by early Native American tribes as the Strawberry Moon because it signaled the time of year to gather ripening fruit. It also coincides with the peak of the strawberry harvesting season. This moon has also been known as the Rose Moon and the Honey Moon.

June 4 - Venus at Greatest Eastern Elongation. The planet Venus reaches greatest eastern elongation of 45.4 degrees from the Sun. This is the best time to view Venus since it will be at its highest point above the horizon in the evening sky. Look for the bright planet in the western sky after sunset.

June 12, 13 - Venus in the Beehive. The planet Venus will pass through the beehive cluster, an open cluster of stars located in the constellation Cancer. Venus can be seen in or very near the cluster on the nights of June 12 and 13. A good pair of binoculars should be enough to see this rare event all though a telescope will provide a much better view.

June 17 - 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 **0050**. 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.

June 21 - June Solstice. The June solstice occurs at **0751**. The North Pole of the earth will be tilted toward the Sun, which will have reached its northernmost position in the sky and will be directly over the Tropic of Cancer at 23.44 degrees north latitude. This is the first day of summer (summer solstice) in the Northern Hemisphere and the first day of winter (winter solstice) in the Southern Hemisphere.



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Algol minima: (All times Pacific Time)

06/02/2023	2011
06/05/2023	1700
06/08/2023	1348
06/11/2023	1037
06/14/2023	0726
06/17/2023	0415
06/20/2023	0104
06/22/2023	0952
06/25/2023	1841
06/28/2023	1530



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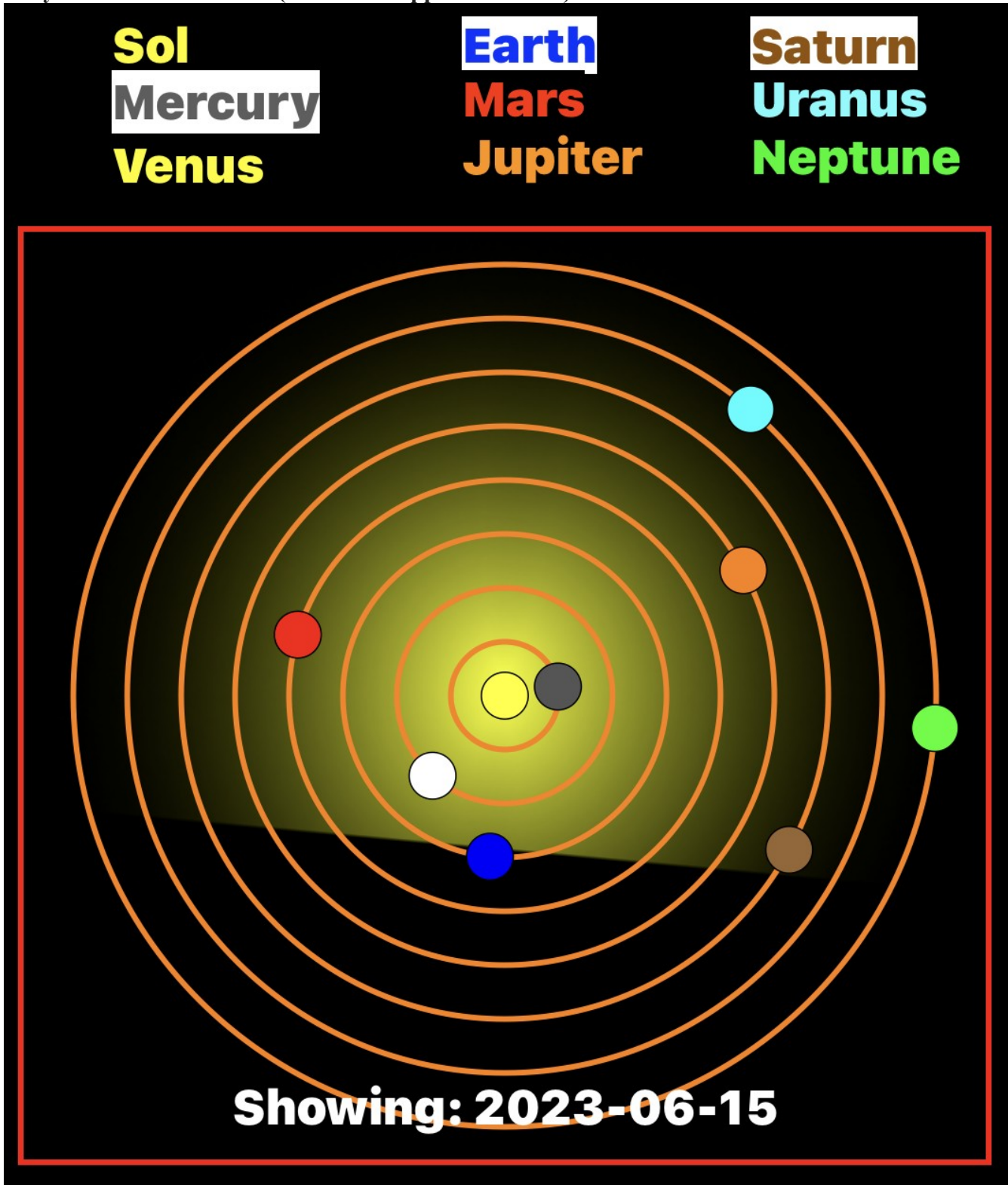


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Planets:

Planetary Positions June 2023: (from TVA App iOS version)





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- **Mercury:** Mercury is a morning object in the beginning of the month rising at **0428**, transiting at **1109** and setting at **1751**. Mercury by mid-month has become a morning object rising at **0435**, setting at **1839**. By the 30th Mercury is lost to the Sun.
- **Venus:** Is the Evening Star on the first of the month. Venus rises at **0852**, transits at **1604** and sets at **2316**. Venus is 51% illuminated and has an apparent magnitude of -4.28. By mid-month Venus is still the Evening Star rising at **0902**, transiting at **1602** and setting by **2302**. By end of month Venus is still the Evening Star rising at **0901**, transiting at **1547** and setting at **2231**.
- **Mars:** Mars is an evening object on the first of the month. Mars rises at **0947**, transits at **1647** and sets by **2347**. By mid-month Mars is rising at **0933**, transits at **1625** and doesn't set until **2318**. End-of-month finds the Warrior rising at **0917** transiting at **1601** and setting at **2245**.
- **Jupiter:** Jupiter is a morning object on the first of the month. Jupiter rises at **0200**, transits at **0840** and sets at **0521**. By mid-month Jove as a morning object rises at **0112**, Jupiter transits at **0754** and sets at **1436**. Come the end-of-month Jupiter rises at **0019** and sets at **1346**.
- **Saturn:** Saturn is a evening object on the first of the month rising at **2310**, transiting at **0445** and setting at **1020**. Saturn by mid month rises by **0017**, transiting at **0525** and setting at **1128**. By the end-of-the-month Saturn rises by **2318**, transits at **0453** and set at **1026**.
- **Uranus:** On the first of the month Uranus is a morning object rising at **0428**, transiting at **1120** and setting at **1812**. By the ides Uranus is rising at **0336**, transiting at **1026** and setting by **1721**. End-of-month finds Uranus as a morning object rising at **0239**, transiting at **0932** and setting at **1625**.
- **Neptune:** Neptune in the beginning of the month is a morning object. Neptune rises at **0204**, transits at **0802** and sets by **1359**. By the 15th Neptune rise at **0110**, transits at **0707** and sets by **1305**. The 8% illuminated Moon will be rising in 2-hours after Neptune. By the end of the month Neptune is rising at **0011**, transiting at **0609** and set by **1206**.
- **Pluto:** Pluto on the first of the month is a morning object rising at **2318**, transiting at **0417+** and setting at **0917+**. By mid-month Pluto is rising by **2222**, transiting by **0322+** and sets by **0821+**. Pluto's apparent magnitude is 14.39 so good luck if you're looking. By the 30th Pluto is rising at **2122** transits at **0221+** and sets at **0720+**.

Asteroids:

- Still a dearth of asteroids. I searched for asteroids in 2023 with a reasonable magnitude; say less than or equal to +10 in June 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:

- Very slow for June...none at all.

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 June 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.



No comets of interest this month at time of writing.

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

Lets take a look at some unusual objects:

- NGC 5866:



Illustration 1:

*By NASA, ESA, and The Hubble Heritage Team (STScI/AURA) -
<http://www.spacetelescope.org/images/opo0624a/> (direct link)
<http://hubblesite.org/newscenter/archive/releases/2006/24/image/a> (direct link), Public Domain, <https://commons.wikimedia.org/w/index.php?curid=5968476>*

NGC 5866 (also called the Spindle Galaxy or Messier 102) is a relatively bright lenticular galaxy in the constellation Draco. NGC 5866 was most likely discovered by Pierre Méchain or Charles Messier in 1781, and independently found by William Herschel in 1788. Measured orbital velocities of its globular cluster system imply that dark matter makes up only $34 \pm 45\%$ of the mass within 5 effective radii, a notable paucity. (Wikipedia)



Illustration 2: Rho

Ophiuchi Region, with the main dark nebula Lynds 1688 (and further L1689) to the left, ρ Ophiuchi at the center of the large blue area (IC 4604), Antares in the large yellow area and Sigma Scorpii in the redish Sh2-9 area, with Messier 4 inbetween the latter two stars. North is up.

By Adam Block/Steward Observatory/University of Arizona -

<https://www.adamblockphotos.com/antares-and-rho-ophiuchi.html>, CC BY-SA 4.0, <https://commons.wikimedia.org/w/index.php?curid=85882906>



○ **NGC 7789:**

The Rho Ophiuchi cloud complex is a complex of interstellar clouds with different nebulae, particularly dark nebulae which is centered 1° south of the star ρ Ophiuchi, which it among others extends to, of the constellation Ophiuchus. At an estimated distance of 131 ± 3 parsecs, or 460 light years, it is one of the closest star-forming regions to the Solar System.

Cloud complex

This cloud covers an angular area of $4.5^\circ \times 6.5^\circ$ on the celestial sphere. It consists of two major regions of dense gas and dust. The first contains a star-forming cloud (L1688) and two filaments (L1709 and L1755), while the second has a star-forming region (L1689) and a filament (L1712–L1729). These filaments extend up to 10–17.5 parsecs in length and can be as narrow as 0.24 parsecs in width. The large extensions of the complex are also called Dark River clouds (or Rho Ophiuchi Streamers) and are identified as Barnard 44 and 45. Some of the structures within the complex appear to be the result of a shock front passing through the clouds from the direction of the neighboring Sco OB2 association.

Temperatures of the clouds range from 13–22 K, and there is a total of about 3,000 times the mass of the Sun in the material. Over half of the mass of the complex is concentrated around the L1688 cloud, and this is the most active star-forming region. There are embedded infrared sources within the complex. A total of 425 infrared sources have been detected near the L1688 cloud. These are presumed to be young stellar objects, including 16 classified as protostars, 123 T Tauri stars with dense circumstellar disks, and 77 weaker T Tauri stars with thinner disks. The last 2 categories of stars have estimated ages ranging from 100,000 to a million years.

The first brown dwarf to be identified in a star-forming region was Rho Oph J162349.8-242601, located in the Rho Ophiuchi cloud. One of the older objects at the edge of the primary star-forming region was found to be a circumstellar disk seen nearly edge-on. It spans a diameter of 300 AU and contains at least twice the mass of Jupiter. The million-year-old star at the center of the disk has a temperature of 3,000 K and is emitting 0.4 times the luminosity of the Sun..

(Wikipedia)

June is great for both viewing and imaging. Spend some time outside with your scope. Summer is here!

For now – Keep looking up.



RANDOM THOUGHT June 2023

By Chuck Dyson

DON'T ROW. THROW YOUR OARS AWAY!

This was the first advertising slogan of the Evinrude outboard motor company in 1909 and this little gas powered motor changed boating forever. Today instead of rowing quietly across lakes people zip across them, often towing a water skier or two, in boats with hulls designed for speeds and stresses never dreamed of in the rowboat era.

So how, you may ask, does this have anything to do with astronomy? Let's start by looking at the population of California in 1910, only a year after the invention of our outboard motor, the state had an astounding population of 2,377,549 people while Los Angeles County had 504,131 people and in 1905 the city of Los Angeles had about 200 street lights. Today the Riverside County has a population of 2,463,893, 86,344 more people than were in the entire state in 1910, and the Temecula-Murrieta metropolitan area has a population of 965,000 almost double the population of L.A. County, and just for a good dark sky killing measure L.A. now has around 230,000 street lights. It appears, however, that over the last one hundred and ten years our equipment has gotten bigger and better. In 1910 the average scope was a 60mm to 76mm refractor and if you wanted a Newtonian you built it yourself. Today's popular Schmidt-Cassegrain telescope was not produced until 1946 and didn't become commercially available until 1970, but the skies have gotten brighter resulting in an observing stalemate, mostly.

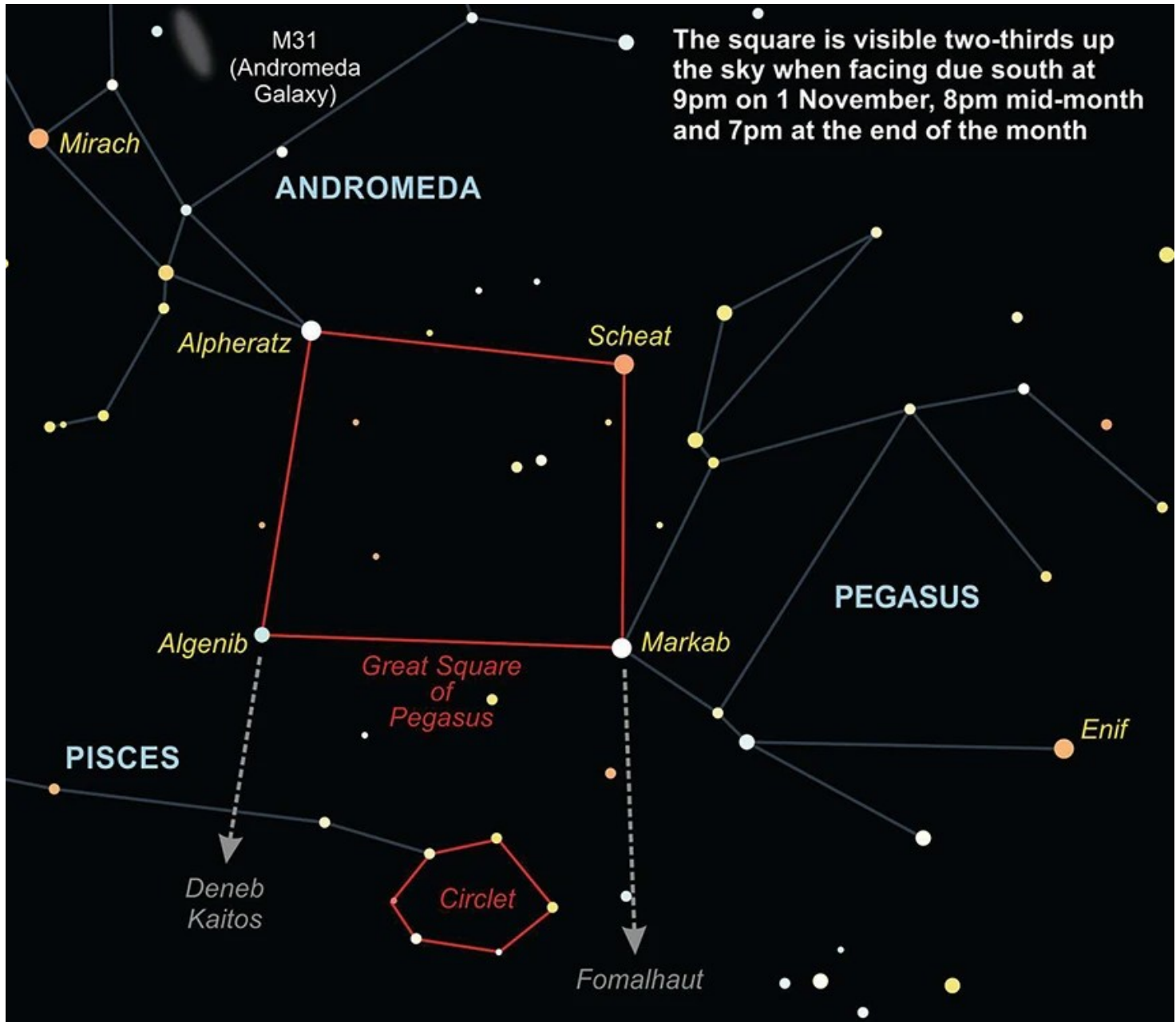


Figure #1

I say mostly because in urban areas the sky can be so bright that you can only see stars of mag three or brighter. On exceptional nights in Menifee I can just make out mag four stars. This means that in urban areas there are only 283 stars in the entire night sky that are visible while here in Menifee there are 893 stars in the entire night sky that are visible. Technically speaking from any point on earth you can see 50% of the night sky but practically speaking because of the atmospheric haze dimming stars at the horizon we may actually see only 40% of the sky on a good night. As a result for our mag three sky we will have only 113 visible stars in it and our mag four sky will have 357 visible stars. This may sound like a lot of stars but remember the sky is big and there is a lot of distance between each of those stars. With star hopping the fewer stars you can see visually and the farther you need to hop the harder it gets, especially if your



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finder is not a correct image design. To get an idea of just how bad or good your skies are you can do the great square of Pegasus test (figure #1). On a moonless night from October to December when Pegasus is at the meridian locate the square and then count the stars you can see inside the square. If you see 0 stars your sky is poor, up to 5 stars your sky is average, up to 13 stars good, and up to 35 stars exceptional. After counting the stars inside the square then go below the square and locate the circlet asterism in Pisces. If you can see all six stars in the circlet, congratulations you have dark skies and good seeing all the way to the horizon. If you do have uniformly bright skies, you can still do what amateur astronomers did over a hundred years ago, look at the Moon, planets, and double stars. Note: My personal favorite objects to look at in order to judge my sky quality for the night are as follows. NGC 457 or the Owl cluster in Cassiopeia. The Owl's eyes are easy to see but stars in the body require dark skies. NGC 188 or Caldwell 1- this is an open cluster in Cepheus just 5 degrees from Polaris so it is in the sky all night long all year long; however, it only has dim stars so it is only visible under truly dark skies (I never look for this one in Menifee, only at country sights). Going South to Cancer I look for any stars in the constellation and if I see three or four I then have high hopes for the night's viewing. Then if I manage to spot Cancer's far away and dim open cluster M67, I get really excited. My final sky check cluster is really far South and is the open cluster NGC 2362 in the dog's tail of the constellation Canis Major. Because NGC 2362 is so far south it is a good check on the seeing near the horizon. On really clear nights and with at least six inches of aperture the stars of NGC 2362 form a distinct triangle, and that's a really good sign. On the other hand, if this is more work than you want to do to identify a decent night for star hopping you can take the first step toward "throwing away your oars".

The first step in throwing your oars away is to get a Go-To telescope mount. There are both Alt-Az mounts and Equatoria mounts available with the Alt-Az just a little easier to set-up. Personally I find that the calibration process just a bit of a bother especially when I just finish the calibration and someone bumps the scope and mount and I have to do it all over again. That being said, when Go-To works it really works well and finding new objects for the first time is a joy when compared to the star hopping technique. With a Go-To set-up you are much more likely to hunt down new objects than you are when star hopping.

Although Go-To was a boon to observers finding objects in light polluted skies it still had some challenges (challenges is code for stuff that really does not work that well). Chief among them was reading the digital display of your hand set, getting a really correct time and location for the mount, finding some of the mounts dimmer recommended alignment stars, and having to do the entire alignment process over again if your clutches slipped or the mount was bumped. Having WiFi built into the mount and working with your cellphone seems to have ended the first problem. Having a built in GPS or a GPS add-on unit, at extra cost, can give your mount its exact location and exact altitude and exact UTC (Coordinated Universal Time), best polar alignment ever. Go-To mounts display the names of the calibration stars they like to use but the trouble is that unless you are a student of star names you are in the dark as to which star is the one you are supposed to center in the eyepiece (Several kindly Celestron users have published, on line, lists of the Celestron calibration stars and the constellations that they are in and their brightness and this is a big help in getting your scope aligned.) Finally the new Celestron StarSense line of beginners scopes uses your cell phone locked onto the telescope to tell you where to push, these are non-powered mounts. They mount to the telescope and alert you when you are on target (this app is getting rave reviews on the internet for ease of use). Finally some Go-To systems have placed additional encoders in the mount that allow the scope to be moved manually and not lose orientation and require recalibration, a blessing at star parties where every kid is a Tarzan trying to swing on the end of your scope.



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Manufacturers have really made the alignment process use-friendly, even for a tech dummy like me, but there is still one problem left. In my back yard I can have my telescope slew to the crab nebula with superb accuracy, I look into the eyepiece, and I still cannot see the crab nebula because of all of the light pollution. Time to throw away the oars, i.e. the optical telescope, and get an electronic telescope? Also when you go to the internet and lookup sights that help you set-up your new Go-To telescope the vast majority of them show how to set-up the scope for astrophotography not visual observing. Is this just an urban observers phenomenon? Well, even at the T.V.A.'s semi dark sky site at the South Coast Winery eight inch telescopes struggle mightily to even get a glimpse of the Crab Nebula or a galaxy, other than Andromeda, while the Unistellar 4 1/2 inch electric telescope clearly shows the Crab Nebula and numerous dim, in optical scopes, galaxies. Light pollution and its ever increasing reach into the countryside has definitely created a need and market for enhanced viewing options. The main reason a little 4 1/2 inch electronic telescope is so much better at showing extended deep sky objects than even a 12 inch visual scope is that our eyes are cameras that work at 1/29th of a second; so, if your electronic telescope builds an image over ten seconds it is sending an image to your cellphone or laptop that is constructed from 290 times more photons than your eye used in constructing the image that it sent to your brain.

I think the best explanation as to why people are going, in increasing numbers, to electronic sensors rather than eyepieces was put forth by a person who was selling his eyepieces online: "Between my eyes (astigmatism) and local skies ((light pollution), all the photons I collect these days hit camera sensors rather than retinas." A sad but accurate assessment because as our eyes get older and our skies get brighter we are able to see so much less at the eyepiece.

CHEERS

CHUCK

Another Look June 2023

By Dave Phelps

The Full Moon for this month will occur early in the month on Sunday, June 4th. The New Moon will happen later in June on Sunday, June 18th.

In North America, the harvesting of strawberries in June gives that month's full moon its name, Strawberry Moon. Europeans have dubbed it the rose moon, while other cultures named it the hot moon for the beginning of the summer heat.

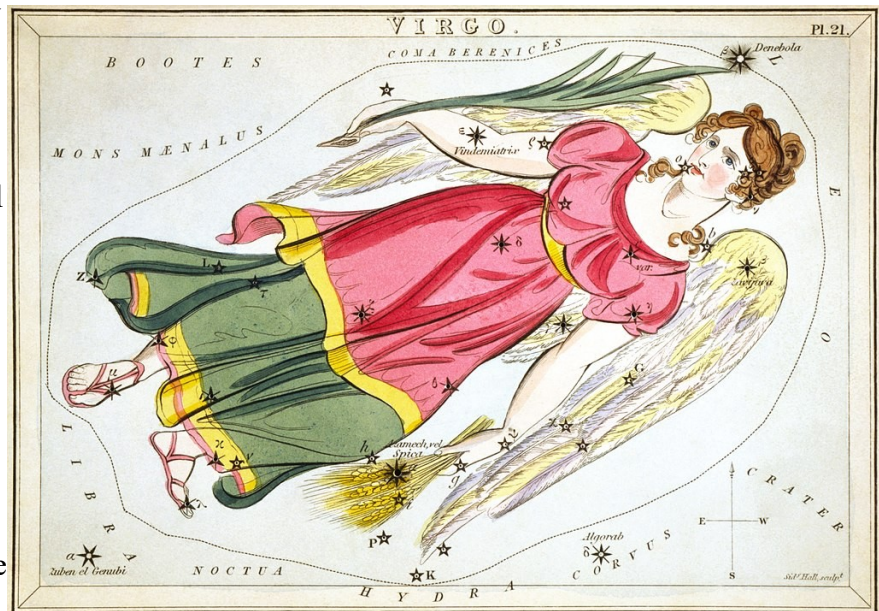
In June it's the Strawberry Moon as the little red berries ripen at this time and could be gathered by the Native American tribes. Other native names are Berries Ripen Moon, Green Corn Moon, and Hot Moon. The Celtic names are Mead Moon, Horse Moon, Dyan Moon, Rose Moon and Honey-Moon. Other English names are Flower Moon and Planting Moon.

The Summer solstice is on Wed, Jun 21, 2023 7:57 AM PDT

In the Northern Hemisphere, the Summer Solstice occurs when the sun is directly above the Tropic of Cancer, usually June 21.

<https://publicdomainreview.org/collection/urania-mirror-or-a-view-of-the-heavens>

When we look back at the history behind the constellations we find a remarkable divergence from old, very old, very very old, recently new, and kinda new. Hevelius, Mercator, Bayer and all the astronomers and cartographers from mid-millennium forward relied on Ptolemy and the giants of the classical era for the basic model of the heavens they used for their maps and globes. The first millennium BCE saw the rise of tribes of the middle east and their myths, legends, and stories. These are the cultures created around the confluence of the Tigris and Euphrates plus nation forming on the Arabian peninsula and the Indian sub-continent. As it was, the Greeks were relative late bloomers and the Romans almost certainly copycats.

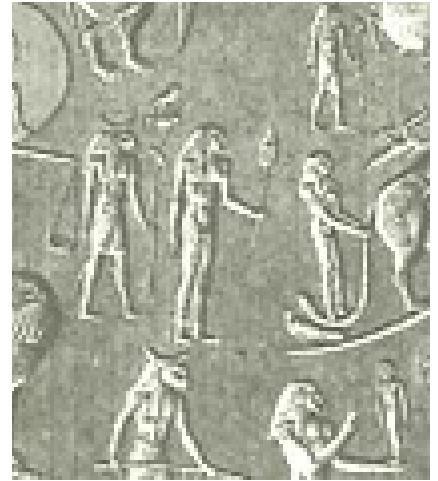


<https://collections.louvre.fr/en/ark:/53355/c1010028871>

From the Dendurah Zodiac, Egypt, now in the Louve.

When did it start? Just how old is astronomy? It almost certainly began with the naturalistic representations of star locations and formations as named clocks, calendars, timetables, and humanistic deities and the sympathetic magic they associated with everyday life. Where does it start? There is evidence of the Egyptians, Euphratians, and other cultures rising as early as the stone age using the certain stars as harbingers of seasonal changes and the relationship during the seasons when particular asterisms and stars shone during planting, shearing, and lambing.

Is astronomy the oldest science? It has been claimed that we recognized star formation and seasonal relationships as early as 5000 BCE. One of those formations, of a young woman, with and without wings or with and without wheat or corn has been a part of astronomical lore worldwide for at least the last 5000 years. We can identify her during the Bronze age including early Egyptian old kingdom, Mesopotamian early dynasties, Akkadian, and the Indus Valley.



In Egypt she was Isis who formed the Milky Way from corn. Isis did not carry a sheaf of wheat in her right hand, she carried a tool called a distaff that women used in the spinning of wool and in Egypt, flax. At that same time in the Euphrates she was named Ishtar, goddess and proclaimer of rain and Astarte, Bel's wife.

In India she was known as "the Maiden". We even have evidence of a zodiac created in Ceylon where Virgo is a woman on a ship with a stalk of wheat. An interesting story comes from the Scottish-English merge where the constellation marks the time of the "Kern" i.e. Corn baby.

The Arabs, who did not draw the human body called her Ears, the Chinese the Frigid Maiden. We even found evidence in Peru (Incas) where the asterism was called the Magic Mother.

So it is clear that Virgo is world wide throughout history and is almost certainly one of the oldest star formations identified and named.

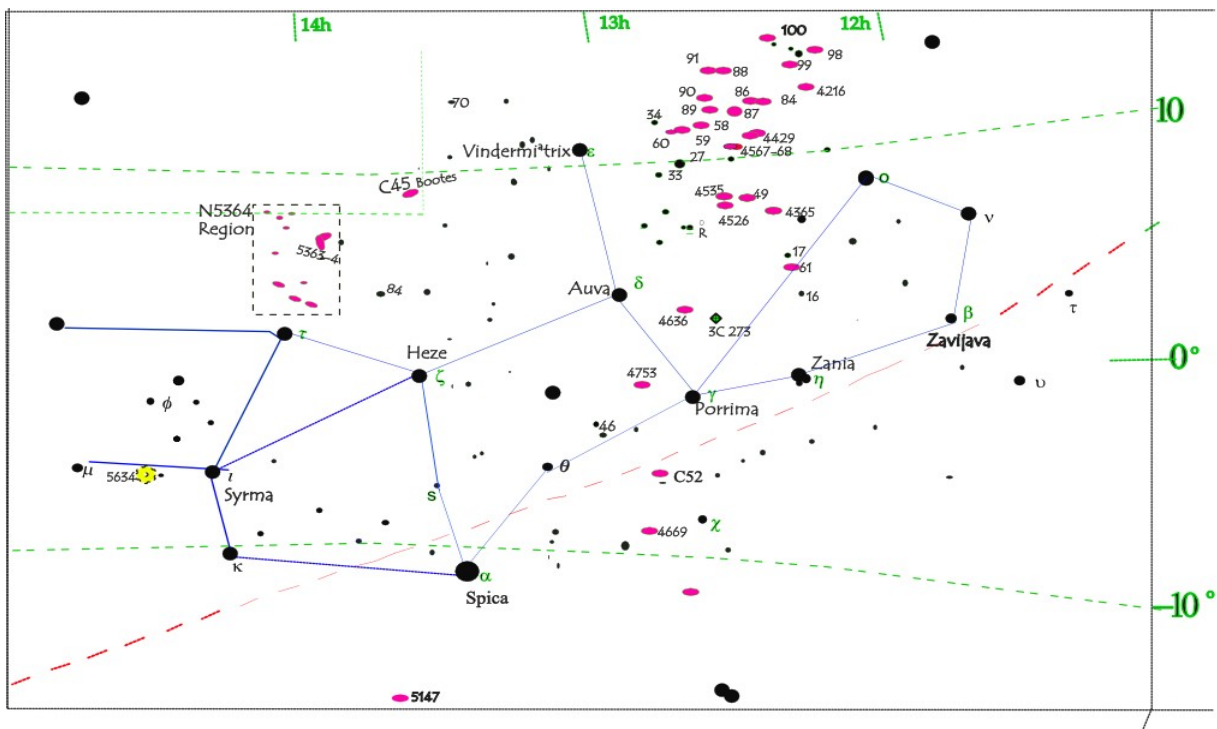
Below Bootes thou seest the Virgin,
An ear of corn held sparkling in her hand.
Whether the daughter of Astraeus, who
First grouped the stars, they say, in days of old.
Or whencesoever,—peaceful may she roll.

Her lovely tresses glow with starry light,
Stars ornament the bracelet on her hand;
Her vest in ample fold glitters with stars;
Beneath her snowy feet they shine, her eyes
Lighten all glorious, with heavenly rays,
But first the star which crowns the golden sheaf.

Virgo has eight named stars. Herschel counted 383 galaxies and one globular cluster. Burnham has 213 galaxies, 1 globular cluster, 68 variable stars, 109 double and multiple star systems and one quasi-stellar object. Eleven of the galaxies are Messier's and one is a Caldwell.

By themselves, the star's names draw a history of Virgo. As mentioned, the Arabs do not draw images of humans. So to them, this area was a dog kennel. The stars ϵ , δ , γ , η , and β form a bowl that was a kennel as well as the finder for the Virgo Cluster. β "Zavijava" comes from the meaning for the word kennel, as does γ Porrima from "corner of the barker". Porrima by the way is also the name of one of the goddess's of prophecy and peace. It was she who held, in some stories, the scales, Libra, who follows her in the night.

A whole new tradition is formed around ϵ Virginis, named Vindemiatrix, the grape gatherer, another clock in the sky signaling the time to pick the grapes and make the wine. Vindemiatrix is also, at 2nd mag. The third brightest star in Virgo. But, where's the girl? We do have stellar references to the maiden: ι , Iota Virginis, named Syrma, means skirt and ζ Zeta Virginis, Heze, points to "under the girdle". Rolling all around the tradition we come to α , Alpha Virginis, Spica, signifying an ear of wheat.



Globe celeste de Coronelli Paris France Wikipedia Commons

The basic design of the images drawn in the Atlas goes back at least 400 years to Bayer's Uranometria in 1603. He took Ptolemy's catalog and expanded it, imagined it, drew it and numbered it. He assigned Greek letters to the stars till they ran out and then Latin letters. Subsequent map makers seemed to have copied his basic design at least until the 19th century where they were idealized by cartographer Sidney Hall, whose Virgo is near the top of this article and by Vincenzo Coronelli, shown here, from about 1688.



Virgo has Messier's M49, M58, M59, M60, M61, M84, M86, M87, M89, M90 and M104. She also has Caldwell object C52.

[https://](https://www.temeculavalleyastronomers.com/photo-gallery.html)

www.temeculavalleyastronomers.com/photo-gallery.html

M84 and M86 Markarian's Chain Image by Curtis Croulet, TVA

All of Virgo's Messier galaxies are in the 8th and 9th magnitude making great objects for our backyard telescopes and great fun galaxy hopping. As an example, I remember using M87 and the galaxies around it as finders when I found Pluto at RTMC years ago.



M89 is another featureless ball in your 8" It is a perfectly symmetrical elliptical. You may see a brighter nucleus.



A little over a moon diameter in your field of view is M90.

<https://ocastronomers.org/wp-content/uploads/2019/01/m089.jpg>

<https://ocastronomers.org/wp-content/uploads/2019/01/m090.jpg>

M90 is big, so you will see it easily in your 8" Dob. Still you will need your C14 and decent seeing to pick out spiral arms.



Now we're getting somewhere. M104, the Sombrero is findable in your binoculars and easy in your 8". In my 17.5 the dust lane is well defined and the whole galaxy a beautiful oval.



This is a beautiful image of M61. I don't know what it is about my eyes, but I have a hard time seeing the bar in some galaxies. You'll need your C14 for a hint of the spiral arms. **M 61 Jerry Floyd TVA & M 104 by Jerry Floyd TVA** <https://www.temeculavalleyastronomers.com/photo-gallery.html>





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**Tom Wildoner
Flickr.com
M84, NGC 4387 (small)
and NGC 4388**

M 84 is a tightly wound spiral. It is in a very rich field. M 87 and M88



are right next door.

M49 is the brightest member of the Virgo Cluster at 8th magnitude but visually you will see little of no differentiation. M 49 is kind of a secondary center to the cluster, so searching for and identifying nearby galaxies would be a treat.



Marteen V Flickr.com M49 & NGC4526 is the bright blue spiral

Caldwell 52

[tps://prescottastronomyclub.org/wp-content/uploads/2016/03/Caldwell-Objects.pdf](https://prescottastronomyclub.org/wp-content/uploads/2016/03/Caldwell-Objects.pdf)

M59, M60 & Friends Antione and Dalia Grelin at: <https://www.galactic-hunter.com/post/m59-m60>

Both M59 and M60 are smooth ellipticals that are featureless except for the possibility of seeing a bright or stellar nucleus.



M87 is the center of the Virgo Cluster, a giant smooth elliptical galaxy. The jet was first seen in 1918, but not visible in my 17.5.

https://ocastronomers.org/wp-content/uploads/2018/12/Kuhn_m87_cropped_2x.jpg Pat Knoll



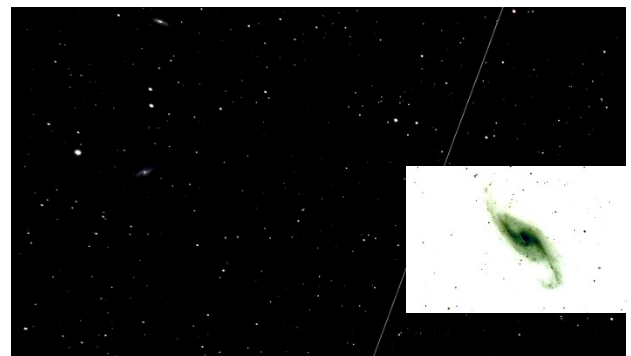
Remidone NGC 5364 - NGC 5363 & Co.Flickr.com

The Virgo III Cloud encompasses eight groups of galaxies and large number if independent galaxies. Virgo III stretches between Virgo, Serpens Caput and Libra. Virgo III is composed of at least 75 clusters stretching between the three constellations. It would be a work of art just to identify visually the individual member clusters. The area I have hatched off on my chart is the location of the NGC 5364 group. The group consists of eight galaxies and is anchored by 11th magnitude NGC 5364.



Virgo is not limited to just Messier's and clusters, however, there are dozens more interesting objects. A few in particular are NGC 4216, NGC 4526, NGC's 4435 & 38 the Eye galaxies, NGC's 4567 & 68 the Butterfly or Siamese Twins and 3C 273 the only quasar I have seen visually.

There has been so much written about quasars since I first heard about them that it would be a semesters study to learn the math and the rudiments. It took a while for the information to drift down from the aether to us mere mortals, but by the mid 80's we had right ascension and declination and charts to help us star hop, so a buddy and I decided to look. Well I was just whelmed. It looked like a 13th magnitude star. Still, its 2.5 billion light years away, which is a significant percentage of the age of our solar system. So, if you want to go, go take a look. The quasar is in the middle of the image. The three galaxies are, from





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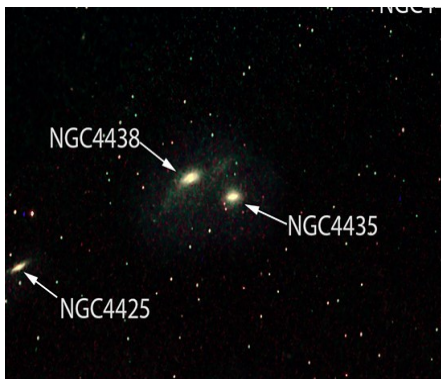
top to bottom, NGC 4527, 11th mag., NGC 4533 14th mag & NGC 4536 11th. 4536 has some interesting structure, it would be worth your while to drill down on it. (Insert) **Flickr.com Michel Arzoumanian** wide field courtesy of **Flickr.com Steve Knight**

Up around the middle of the M's is a bright threesome anchored by 9th magnitude NGC 4216. It's long and thin with a bright nucleus. Its two companions are NGC's 4222 and 4206. Image was taken by Stephen Armen on the SDAA's astrobin link.

<https://www.astrobin.com/wkenud/B/?nc=&ncc=>



If you look on my chart near the center of the bowls where the Arabs identified the “Kennel Corner of the Barking Dogs” you will find a smallish grouping of galaxies anchored by NGC 4526. In the image by Camille Colombo, 4526 is the lenticular galaxy to the left between the two stars. If you search for a professional image Camille COLOMB **Flickr.com** it will show a spectacular haloed galaxy with an enormous dark lane. The colorful face on spiral is NGC 4535. It looks slightly barred and it also looks like it will take some magnification. The two galaxies are within range of our telescopes at 10th and 11th magnitude.



“The Eyes” Ray Stann TVA Why is it called Markanian’s Chain? The feature has been at least partially known since Herschel’s time and all the individual galaxies are included in Dryer’s catalog. Markanian was the one to show that the whole curved arc of galaxies had the same proper motion. Near the center of the chain are NGC 4435 and 4438, a pair of 10th magnitude interacting galaxies called “The Eyes”. N4438 shows some interesting structure under magnification.

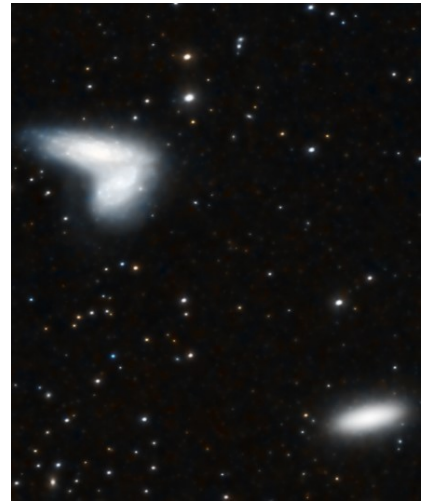


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One of the more interesting examples of interacting galaxies in the Virgo Cluster is the Butterfly- NGC's 4567 & 4568. They also have detail under magnification but you will need some mirror size, they were beautiful in my 17. Their combined magnitude of the pair is 12 and they are less than 3 arc-minutes in size. The companion galaxy on the lower right of the image is NGC 4564. Jerry L. Floyd
TVA <https://www.temeculavalleyastronomers.com/photo-gallery.html>

Have a great time enjoying Virgo, and I wish you
Dark Skys





This article is distributed by NASA's Night Sky Network (NSN). The NSN program supports astronomy clubs across the USA dedicated to astronomy outreach. Visit nightsky.jpl.nasa.gov to find local clubs, events, and more!

Look Up in the Sky - It's a Bird

Theresa Summer

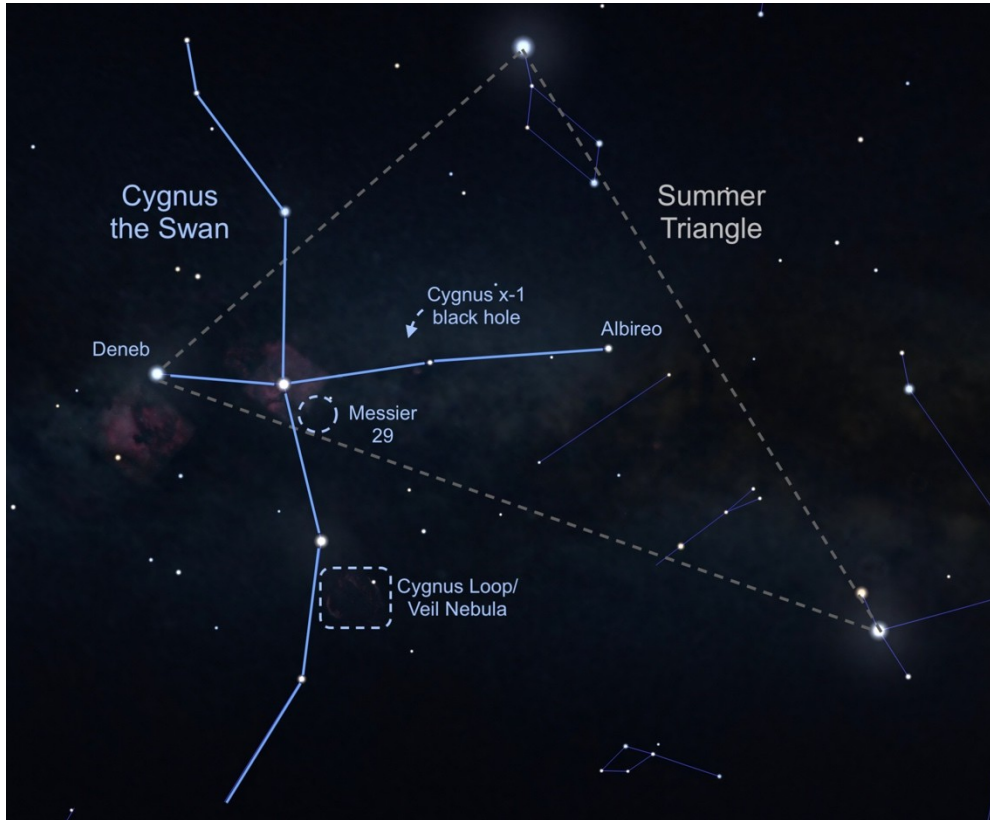
Bird constellations abound in the night sky, including **Cygnus**, the majestic swan. Easy to find with its dazzling stars, it is one of the few constellations that look like its namesake and it is full of treasures. Visible in the Northern Hemisphere all summer long, there's so much to see and even some things that can't be seen. To locate Cygnus, start with the brightest star, **Deneb**, also the northeastern most and dimmest star of the Summer Triangle. The Summer Triangle is made up of three bright stars from three different constellations – read more about it in the September 2022 issue of Night Sky Notes. "Deneb" is an Arabic word meaning the tail. Then travel into the triangle until you see the star **Albireo**, sometimes called the "beak star" in the center of the summer triangle. Stretching out perpendicular from this line are two stars that mark the crossbar, or the wings, and there are also faint stars that extend the swan's wings.

From light-polluted skies, you may only see the brightest stars, sometimes called the Northern Cross. In a darker sky, the line of stars marking the neck of the swan travels along the band of the **Milky Way**. A pair of binoculars will resolve many stars along that path, including a sparkling open cluster of stars designated **Messier 29**, found just south of the swan's torso star. This grouping of young stars may appear to have a reddish hue due to nearby excited gas.

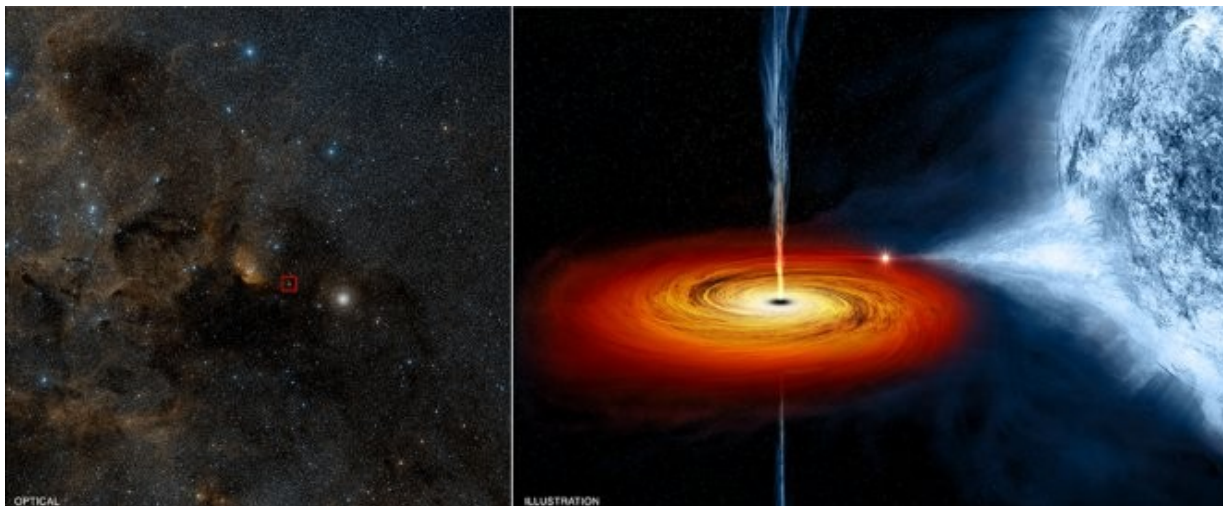
Let's go deeper. While the bright beak star Albireo is easy to pick out, a telescope will let its true beauty shine! Like a jewel box in the sky, magnification shows a beautiful visual double star, with a vivid gold star and a brilliant blue star in the same field of view. There's another marvel to be seen with a telescope or strong binoculars – the Cygnus Loop. Sometimes known as the **Veil Nebula**, you can find this supernova remnant (the gassy leftovers blown off of a large dying star) directly above the final two stars of the swan's eastern wing. It will look like a faint ring of illuminated gas about three degrees across (six times the diameter of the Moon).

Speaking of long-dead stars, astronomers have detected a high-energy X-ray source in Cygnus that we can't see with our eyes or backyard telescopes, but that is detectable by NASA's Chandra X-ray Observatory. Discovered in 1971 during a rocket flight, Cygnus x-1 is the first X-ray source to be widely accepted as a black hole. This black hole is the final stage of a giant star's life, with a mass of about 20 Suns. Cygnus x-1 is spinning at a phenomenal rate – more than 800 times a second – while devouring a nearby star. Astronomically speaking, this black hole is in our neighborhood, 6,070 light years away. But it poses no threat to us, just offers a new way to study the universe.

Check out the beautiful bird in your sky this evening, and you will be delighted to add Cygnus to your go-to summer viewing list. Find out NASA's latest methods for studying black holes at www.nasa.gov/black-holes.



Look up after sunset during summer months to find Cygnus! Along the swan's neck find the band of our Milky Way Galaxy. Use a telescope to resolve the colorful stars of Albireo or search out the open cluster of stars in Messier 29. Image created with assistance from Stellarium: stellarium.org



While the black hole Cygnus x-1 is invisible with even the most powerful Optical telescope, in X-ray, it shines brightly. On the left is the optical view of that region with the location of Cygnus x-1 shown in the red box as taken by the Digitized Sky Survey. On the right is an artist's conception of the black hole pulling material from its massive blue companion star.



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(Credit: NASA/CXC chandra.harvard.edu/photo/2011/cygx1/)



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