



Temecula Valley Astronomer

The monthly newsletter of the Temecula Valley Astronomers Mar 2020

Events:

General Meeting :

Monday, March 2nd, 2020 at the Ronald H. Roberts Temecula Library, Room B, 30600 Pauba Rd, at 7:00 PM. On the agenda this month is “*What’s Up*” by Sam Pitts, “*Mission Highlights*” by Clark Williams then followed by a presentation topic : “*The Science of Palomar Observatory*” by Kin Searcy, SDAA member and Palomar Docent. Refreshments by Mark Dodd.

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



Dark Skies: Turn on the Night. Image & Copyright: [Jeff Dai](#). The residents of the Chinese village of Kaihua decided to turn down many of their lights. [Click here to see the results of their experiment \(NASA APOD\)](#).

General information:

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

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Club Librarian: Vacant

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WHAT'S INSIDE THIS MONTH:

Cosmic Comments

by President Mark Baker

Looking Up Redux

compiled by Clark Williams

Darkness – Part II

by Mark DiVecchio

Dim Delights in Cancer

by David Prosper

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

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Cosmic Comments by President Mark Baker

Since I'm so gabby about Space Missions, just what can we expect to see launched in 2020...!!!

Let's start with getting people into NEO from US soil again...both Boeing, with its **Starliner**, and SpaceX, with its **Dragon**, should be making this happen this year. It is something to look forward to, and loooooong overdue...

The joint NASA and ESA **Solar Orbiter** probe has already been launched and is on its way to studying our favorite Star...

July is looking like a busy month for Martians with launches planned for the NASA **Mars 2020 Rover** (aka Lone Ranger and Tonto, as I call them), the joint ESA / Russian **ExoMars Rosalind Franklin Rover**, the UAE **Hope Mars Mission** launching from Japan, and finally China has a lander / rover on its schedule as well...

Those jumping into the "tourist" industry this year will be Blue Origin and Virgin Galactic...you can finally pay to play in space!!!

India's SSLV, Virgin Orbit, and Firefly Aerospace all will be providing additional access to LEO...

China's **Chang'e 5** mission will be a sample return mission to the Moon...

The Air Force will, for the sixth time, return Boeing's X-37B to orbit for another extended, unmanned stay - 780 days the last time...

And the pending 20km altitude launch and landing of the SpaceX Starship is a point of interest for all space nerds, geeks, and normal humans...

So, you can see, 2020 will be a busy year and proud that TVA "keeps the faith" and encourages all to Look Up, Wonder, and Learn... and yes, "The Stars Are Calling, So We Must Go"!!!

Clear, Dark Skies my Friends...





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



ALL TIMES ARE LOCAL PACIFIC TIME (PDT / PST) 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)

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

Moon Phases for the month by date:

Monday the 2nd @ 1158 FIRST QTR in TAURUS

Monday the 9th@ 1048 FULL in LEO

Monday the 16th @ 0235 THIRD QTR in SAGITTARIUS

Tuesday the 24th @ 0229 NEW in CETUS

Mar 10 6:34 357122 km + F+ 12h Mar 24 15:24 406688 km -- N+ 5h

Apogee comes on 2020-03-24 @ **1524 – 406,688 km (252,705 mi)**

Perigee comes on 2020-03-10 @ **0634 – 357,122 km (221,906 mi)**

2020 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: 2020-Mar-08 : Ends: 2020-Nov-01

Luna: Luna is one day before First Quarter on the 1st of the month setting by **0021**. Luna by mid-month is 52% illuminated. Luna is rising late at **0054** and setting in late morning at **1121**. By the-end-of-the-month Luna is once again a waxing crescent moon, 38% illuminated setting by **0111**.



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

March 9 - 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 17:48 UTC. This full moon was known by early Native American tribes as the Full Worm Moon because this was the time of year when the ground would begin to soften and the earthworms would reappear. This moon has also been known as the Full Crow Moon, the Full Crust Moon, the Full Sap Moon, and the Lenten Moon. This is also the second of four supermoons for 2020. The Moon will be at its closest approach to the Earth and may look slightly larger and brighter than usual.

March 20 - March Equinox. The March equinox occurs at 03:50 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 spring (vernal equinox) in the Northern Hemisphere and the first day of fall (autumnal equinox) in the Southern Hemisphere.

March 24 - 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 09:29 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.

March 24 - Mercury at Greatest Western Elongation. The planet Mercury reaches greatest western elongation of 27.8 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.

March 24 - Venus at Greatest Eastern Elongation. The planet Venus reaches greatest eastern elongation of 46.1 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.

* Supermoon is an Astrology term not an Astronomy term.



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Algol minima: (All times Pacific Time)

03/02/2020	1645
03/05/2020	1334
03/08/2020	1023
03/11/2020	0712
03/14/20	0402
03/17/2020	0051
03/19/2020	2140
03/22/2020	1830
03/25/2020	1519
03/28/2020	1208
03/31/2020	0857

Sun and Moon Rise and Set Times

		Rise	Transit	Set
03/01/20	Sun	061511	120125	174744
	Moon	101217	174442	002148+
03/15/20	Sun	065709	125754	185851
	Moon	015705	070404	121107
03/31/20	Sun	063538	125308	191053
	Moon	111745	184211	020731+

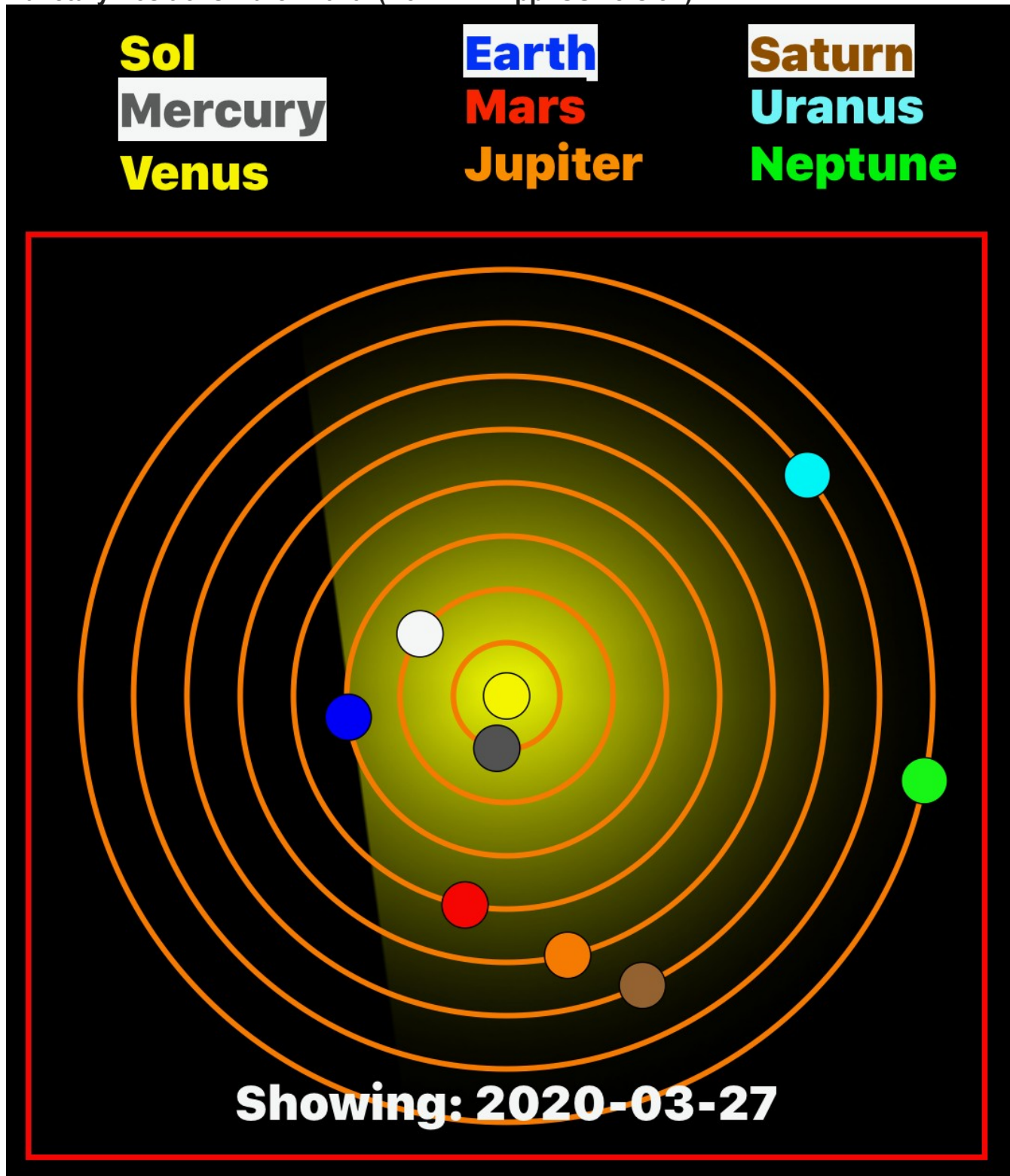


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Planets:

Planetary Positions March 2020: (from TVA App iOS version)





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- **Mercury:** Mercury is a morning object in the beginning of the month. It is poorly illuminated at 5% and 3.18 apparent magnitude. Mercury rises at **0537** with the sun following at **0615**. Mercury by mid-month is rising at **0547** with Sol rising at **0657**. By the 31st Mercury is rising at **0535** preceding sunrise at **0635**.
- **Venus:** Is the Evening Star. Venus sets about **2120** following sunset at **1747** on the first. By mid-month Venus is setting at **2240**. By the 31st Venus is setting at **2258**.
- **Mars:** Mars is an early morning object. Leading the Sun, Mars rises at **0254** on the first. By mid-month Mars is rising at **0339**. End-of-month finds the Warrior rising at **0317**. So if you're a night-owl or an extremely early riser the Red Planet is coming back into view.
- **Jupiter:** Jupiter is a morning object on the first of the month rising at **0332** and preceding sunrise at **0615**. By mid-month Jove is rising at **0346** the sun follows at **0657**. Come the end of month Jupiter is peaking above the horizon by **0252** with sunrise at **0635**.
- **Saturn:** Saturn is trailing Jupiter and leading the Sun, Saturn rises about **0404** on the 1st while sunrise is at **0615**. Saturn by mid month is rising by **0413** preceding sunrise at **0657**. By the end-of-the-month Saturn is rising at **0315** followed by the sun at **0635**.
- **Uranus:** On the first Uranus doesn't set until **2151**. The apparent magnitude is 5.85 so we're on the ragged edge of being naked-eye visible. Luna is in first quarter but it is more than 30° east along the ecliptic. By the ides Uranus is setting at **2159**, following sunset by three hours. End-of-month finds Uranus setting at **2100**.
- **Neptune:** Neptune is trailing sunset by 23 minutes, setting at **1814** at the beginning of the month. Hidden in the glare of Sol you are not likely to find it. By the 15th Neptune is virtually coincident with Sol. By the end of the month Neptune is rising at **0543** and Sol is rising at **0635**.
- **Pluto:** Pluto rises by **0353** on the first of the month preceding sunrise at **0615**. By mid-month Pluto is rising by **0359** preceding sunrise at **0657**. By the 31st Pluto is rising at **0257** followed by sunrise at **0635**. Pluto will be +14.38 apparent magnitude, so with a large enough scope you just might find this elusive jewel.

Asteroids:

- Still a dearth of asteroids. I searched for asteroids in 2020 with a reasonable magnitude; say less than or equal to +10 in March 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=2020>.

Meteors:

- Not much until April
- 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 March have a near circular orbit or an elliptical orbit. The latter being far more common.



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- 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.

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 March 2020 at 2100 PDT and you will have about 20 minutes of viewing time total.

Lets look for some familiar objects:

- o **Messier 38:**



By Miguel Garcia - Own work, CC BY-SA 4.0,

<https://commons.wikimedia.org/w/index.php?curid=38532925>

M38, AKA NGC 1912, is an open cluster of stars in the constellation of Auriga. It was discovered by Giovanni Batista Hodierna before 1654 and independently found by Le Gentil in 1749. Open cluster M36 and M37, also discovered by Hodierna, and often grouped together with M38. Distance is about 1.066 kpc (3,480 ly) away from Earth. The



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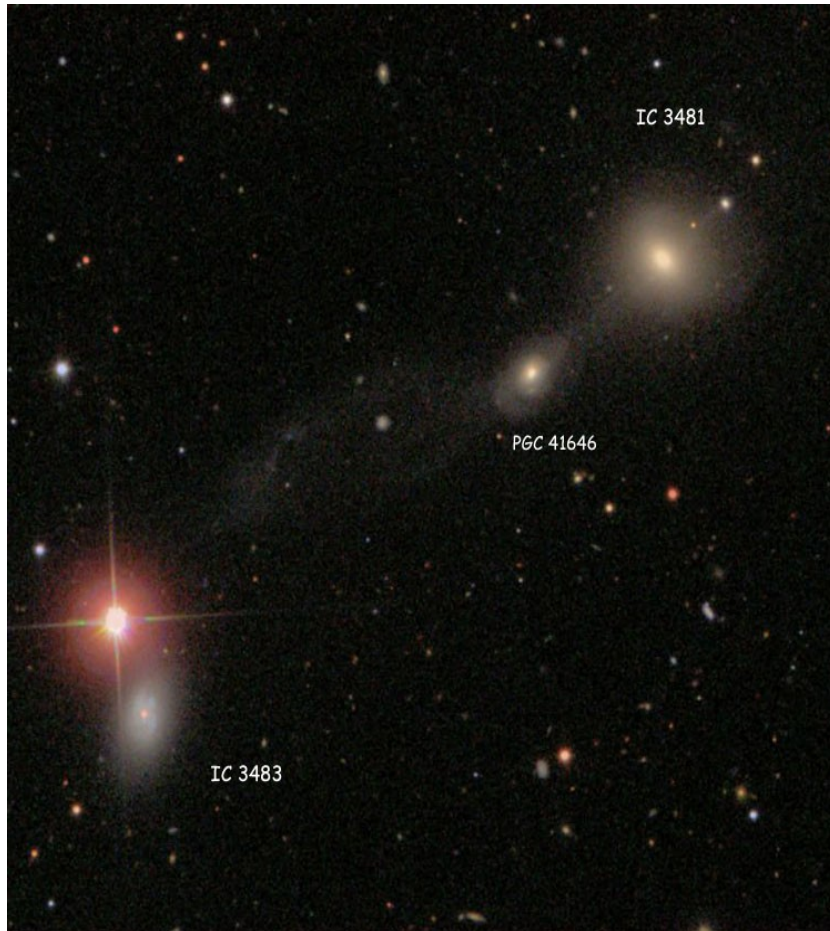
open cluster NGC 1907 lies nearby on the sky, but the two are most likely just experiencing a fly-by, having originated in different parts of the galaxy.

The cluster's brightest stars form a pattern resembling the Greek letter Pi or, according to Webb, an "oblique cross". Walter Scott Houston described its appearance as follows:

"Photographs usually show a departure from circularity, a feature quite evident to visual observers. Older reports almost always mention a cross shape, which seems more pronounced with small instruments. A view with a 24-inch reflector on a fine Arizona night showed the cluster as irregular, and the host of stars made fruitless any effort to find a geometrical figure."

At its distance of 1066 pc., its angular diameter of about 20 arc minutes corresponds to about 4.0 parsecs (13 light years), similar to that of its more distant neighbor M37. It is of intermediate age at about 290 million years. From the population of about 100 stars, this open cluster features a prominent yellow giant with the apparent magnitude +7.9 and spectral type G0 as its brightest member. This corresponds to an absolute magnitude of -1.5, or a luminosity of 900 Suns. For comparison, the Sun would appear as a faint magnitude +15.3 star from the distance of M38. (Wikipedia)

- **Zwicky's Triplet:**



Excerpt/image courtesy of Courtney Seligman

Zwicky's Triplet is a group of three galaxies visible in the constellation Hercules.
([Wikipedia](#))

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

For now – Keep looking up.

Darkness – Part II by Mark DiVecchio

This 3 part series talks about darkness, why darkness is important (and not just to astronomers) and what we can do to keep the sky dark.

Acknowledgment: This series was produced with help from the **International Dark Sky Association** www.darksky.org .

Chapter 2 Why Darkness is Important (and not just to Astronomers)

Circadian Rhythm and Melatonin

Like most life on Earth, humans adhere to a circadian rhythm — our biological clock. It's a sleep-wake pattern governed by the day-night cycle.

Our biological clocks are important. They interact with our body systems, changing our hormone levels and even modifying our genetic code. Natural light helps set our clocks to Earth's 24-hour day-night cycle.

Exposure to artificial light at night disrupts this process, increasing our risks for cancers and other potentially deadly diseases.



Blue-rich light at night is particularly harmful. Most LEDs used for outdoor lighting, computer screens, TVs, and other electronic displays emit abundant blue light.

“Many species (including humans) need darkness to survive and thrive.” — American Medical Association

Glare Impairs Your Vision

Glare from poorly shielded outdoor lighting degrades your vision by decreasing contrast. This limits your ability to see. Aging eyes are especially affected.

“Glare from nighttime lighting can create hazards ranging from discomfort to frank visual disability.” — American Medical Association

Artificial Lights Disrupt the World's Ecosystems

Sea turtles live in the ocean but hatch on the beach at night. Hatchlings find the sea by detecting the bright horizon over the ocean. Artificial lights can draw them away from the sea, stranding them on land. In Florida alone, millions of hatchlings die this way every year.

Many insects are drawn to light, but artificial lights can create a fatal attraction. Declining insect populations negatively impact all species that rely on insects for food or pollination. Nocturnal mammals sleep in the day and are active at night. Light pollution disrupts their nighttime environment.



Artificial Lights Endanger Many Bird Species



Artificial lights can disrupt the migratory schedules of birds causing them to leave too early or too late in the season, missing ideal conditions for nesting. Birds that navigate by moonlight and starlight can wander off course. Millions die every year by colliding into illuminated buildings.

Next time, Chapter 3 What We Can Do to Keep the Sky Dark





Dim Delights in Cancer by David Prosper

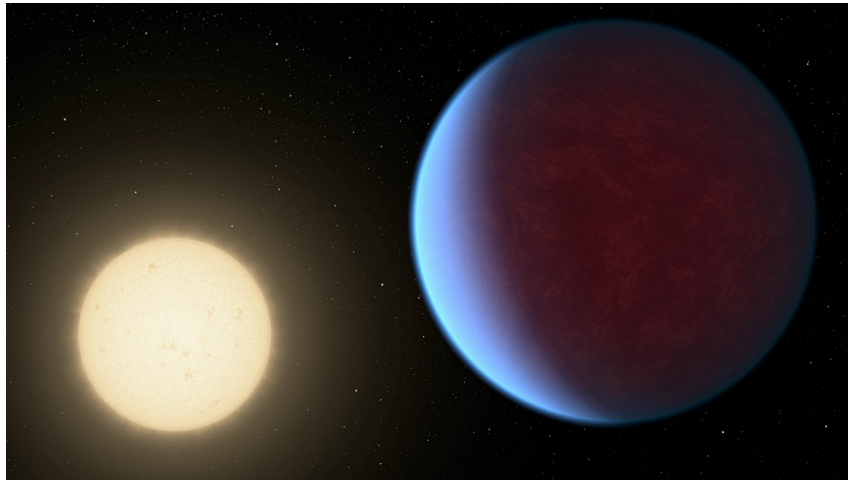
Cancer the Crab is a dim constellation, yet it contains one of the most beautiful and easy-to-spot star clusters in our sky: the **Beehive Cluster**. Cancer also possesses one of the most studied exoplanets: the superhot super-Earth, **55 Cancri e**.

Find **Cancer's** dim stars by looking in between the brighter neighboring constellations of Gemini and Leo. Don't get frustrated if you can't find it at first, since Cancer isn't easily visible from moderately light polluted areas. Once you find Cancer, look for its most famous deep-sky object: the **Beehive Cluster**! It's a large open cluster of young stars, three times larger than our Moon in the sky. The Beehive is visible to unaided eyes under good sky conditions as a faint cloudy patch, but is stunning when viewed through binoculars or a wide-field telescope. It was one of the earliest deep-sky objects noticed by ancient astronomers, and so the Beehive has many other names, including Praesepe, Nubulum, M44, the Ghost, and Jishi qi. Take a look at it on a clear night through binoculars. Do these stars look like a hive of buzzing bees? Or do you see something else? There's no wrong answer, since this large star cluster has intrigued imaginative observers for thousands of years.

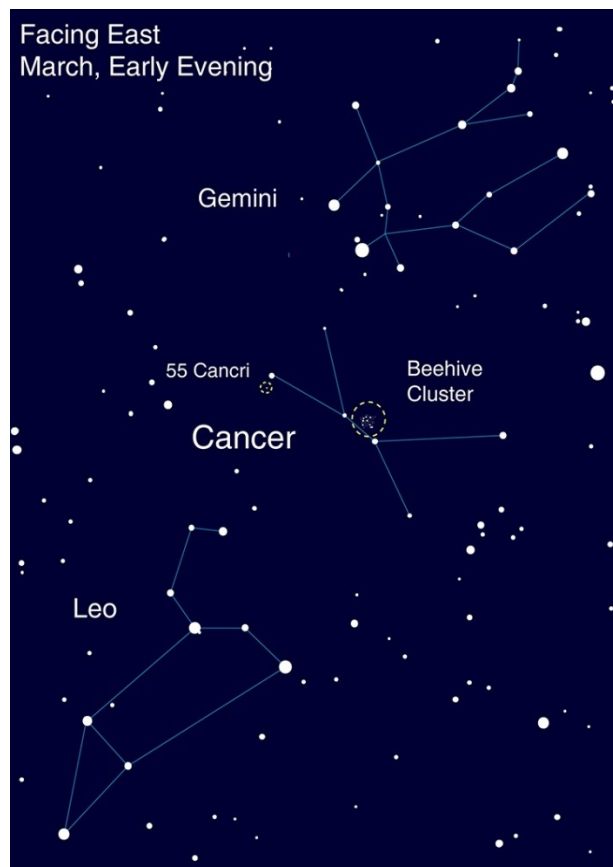
55 Cancri is a nearby binary star system, about 41 light years from us and faintly visible under excellent dark sky conditions. The larger star is orbited by at least five planets including **55 Cancri e**, (a.k.a. Janssen, named after one of the first telescope makers). Janssen is a "super-earth," a large rocky world 8 times the mass of our Earth, and orbits its star every 18 hours, giving it one of the shortest years of all known planets! Janssen was the first exoplanet to have its atmosphere successfully analyzed. Both the Hubble and recently-retired Spitzer space telescopes confirmed that the hot world is enveloped by an atmosphere of helium and hydrogen with traces of hydrogen cyanide: not a likely place to find life, especially since the surface is probably scorching hot rock. The NASA Exoplanet Catalog has more details about this and many other exoplanets at bit.ly/nasa55cancrie.

How do astronomers find planets around other star systems? The Night Sky Network's "How We Find Planets" activity helps demonstrate both the transit and wobble methods of exoplanet detection: bit.ly/findplanets. Notably, 55 Cancri e was discovered via the wobble method in 2004, and then the transit method confirmed the planet's orbital period in 2011!

Want to learn more about exoplanets? Get the latest NASA news about worlds beyond our solar system at nasa.gov.



Artist concept of 55 Cancri e orbiting its nearby host star. Find details from the Spitzer Space Telescope's close study of its atmosphere at: bit.ly/spitzer55cancrie and the Hubble Space Telescope's observations at bit.ly/hubble55cancrie Credit: NASA/JPL-Caltech



Look for Cancer in between the "Sickle" or "Question Mark" of Leo and the bright twin stars of Gemini. You can't see the planets around 55 Cancri, but if skies are dark enough you can see the star itself. Can you see the Beehive Cluster?



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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](#).
