



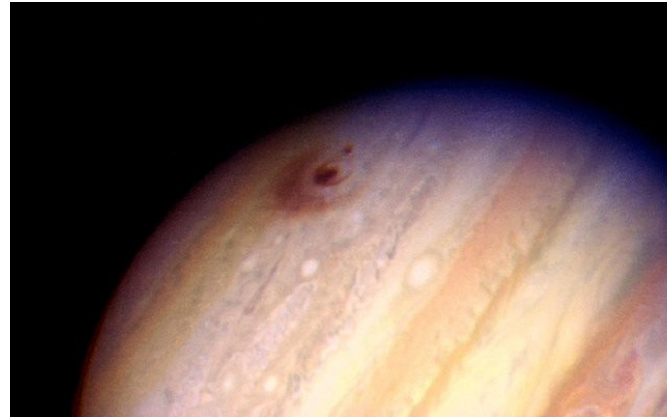
Temecula Valley Astronomer

The monthly newsletter of the Temecula Valley Astronomers May 2020

Events:

Virtual meeting via **Zoom** on **4 May at 7PM**. Join your fellow astronomers for **What's Up, IFI and a Mission Highlight**. Virtual refreshments provided by each participant. Watch your club email for meeting ID and password.

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



NASA Asteroid [Watch@AsteroidWatch](#).
Apr 24 – Happy 30th to @NASAHubble!
Hubble has taken some spectacular images through the years, some of which have been key to NASA's #planetarydefense history! To celebrate, here is an image of #Comet Shoemaker-Levy 9 fragment impacts with Jupiter:
<https://go.nasa.gov/2Kz1bEd> #Hubble30

General information:

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

President: Mark Baker 951-691-0101

<shknbk13@hotmail.com>

Vice President: Sam Pitts <sam@samsastro.com>

Past President: John Garrett <garrjohn@gmail.com>

Treasurer: Curtis Croulet <calypte@verizon.net>

Secretary: Deborah Baker <geedeb@gmail.com>

Club Librarian: Vacant

Facebook: Tim Deardorff <tim-deardorff@yahoo.com>

Star Party Coordinator and Outreach: Deborah Baker

<geedeb@gmail.com>

Address renewals or other correspondence to:

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Members' Mailing List:

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WHAT'S INSIDE THIS MONTH:

Cosmic Comments

by President Mark Baker

Looking Up Redux

compiled by Clark Williams

Become a Citizen Scientist with NASA!

by David Prosper

Send newsletter submissions to Mark DiVecchio <markd@silologic.com> by the 20th of the month for the next month's issue.

Like us on [Facebook](#)



Cosmic Comments by President Mark Baker

I'm mainly talking about Space Science related missions this year, and in April I talked about time and timing... to bring that into a specific perspective, I'd like to chat about the Hubble Space Telescope, which celebrates its 30th anniversary in expanding our awe, wonder, and knowledge of things celestial.

The concept of an HST was first proposed in 1946 – yes, that's right, 1946!!! Keep in mind this is three years before the 200" Hale Telescope at Palomar went into operation and more than a decade before humanity had even put up anything into space...and NASA was a dozen years away from forming. The paper outlining the advantages of such a program were published by a Yale astrophysicist, [Lyman Spitzer, Jr.](#) Recognize the name...???

In 1969, the National Academy of Sciences (NAS) published a paper, "Scientific Uses of the Large Space Telescope" (LST), but it was 1974 before a working meeting on the subject happened. Congress approved funding for the LST, as it was then called, in 1977, and the grinding of the primary mirror started rather quickly in 1978!!! Astronauts even began practicing for servicing missions in 1979 as it was understood the LST would be a work in progress once deployed in LEO...

The name was changed to the Hubble Space Telescope in 1983 in honor of Edwin Hubble and his cosmic contributions, and partly as a "slap" at the bulldog, Spitzer... but he'd finally get his due in a future space telescope!!!

The HST was approaching launch readiness when a sad chapter for the US Space Program occurred in 1986 – the loss of the Space Shuttle Challenger. After the understandable delay, the HST was finally launched on April 24, 1990 via STS-31 Discovery, and has provided exemplary service to humankind ever since...even if it's just the "pretty pictures"!!!

As you can see, good things are often very much worth the wait, even if it takes 44 years!!!
Time and timing...

Hopefully, the time and timing of resuming events for TVA will be a positive for our communities... ironically, a lot of our Star Party schedulers were concerned about the lack of planets the first half of the year. They need not have worried it seems...

But you all practice good time and timing as well - stay safe, be healthy, and remember...
"They can't take the skies from me...!!!"

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

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



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)

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

Moon Phases for the month by date:

Friday	the 29 th	@ 2030 FIRST QTR in GEMINI
Thursday	the 7 th	@ 0346 FULL in LIBRA
Thursday	the 14 th	@ 0703 THIRD QTR in CAPRICORN
Friday	the 22 nd	@ 1039 NEW in TAURUS
Friday	the 29 th	@ 2030 First QTR in LEO

Apogee comes on 2020-05-18 @ 0046 - 405,583 km (252,018 mi)

Perigee comes on 2020-05-05 @ 2005 - 359,655 km (223,479 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 in First Quarter on the 1st of the month transiting at 1915 setting by 0312+. Luna by mid-month is 36% illuminated. Rising early at 0223 and setting in early afternoon at 1332. By the-end-of-the-month Luna is waxing gibbous, 73% illuminated transiting at 2043 and setting by 0259+.

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



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May 4, 5 - Eta Aquarids Meteor Shower. The Eta Aquarids is an above average shower, capable of producing up to 60 meteors per hour at its peak. Most of the activity is seen in the Southern Hemisphere. In the Northern Hemisphere, the rate can reach about 30 meteors per hour. It is produced by dust particles left behind by comet Halley, which has known and observed since ancient times. The shower runs annually from April 19 to May 28. It peaks this year on the night of 4th and morning of the 5th. The nearly full moon will be a problem this year, blocking out all but the brightest meteors. But if you are patient, you should still should be able to catch a few good ones. Best viewing will be from a dark location after midnight. Meteors will radiate from the constellation Aquarius, but can appear anywhere in the sky.

May 7 - 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 10:45 UTC. This full moon was known by early Native American tribes as the Flower Moon because this was the time of year when spring flowers appeared in abundance. This moon has also been known as the Corn Planting Moon and the Milk Moon. This is also the last of four supermoons* for 2020. The Moon will be near its closest approach to the Earth and may look slightly larger and brighter than usual.

May 22 - 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 17:39 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.

* Supermoon is an Astrology term not an Astronomy term.



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Algol minima: (All times Pacific Time)

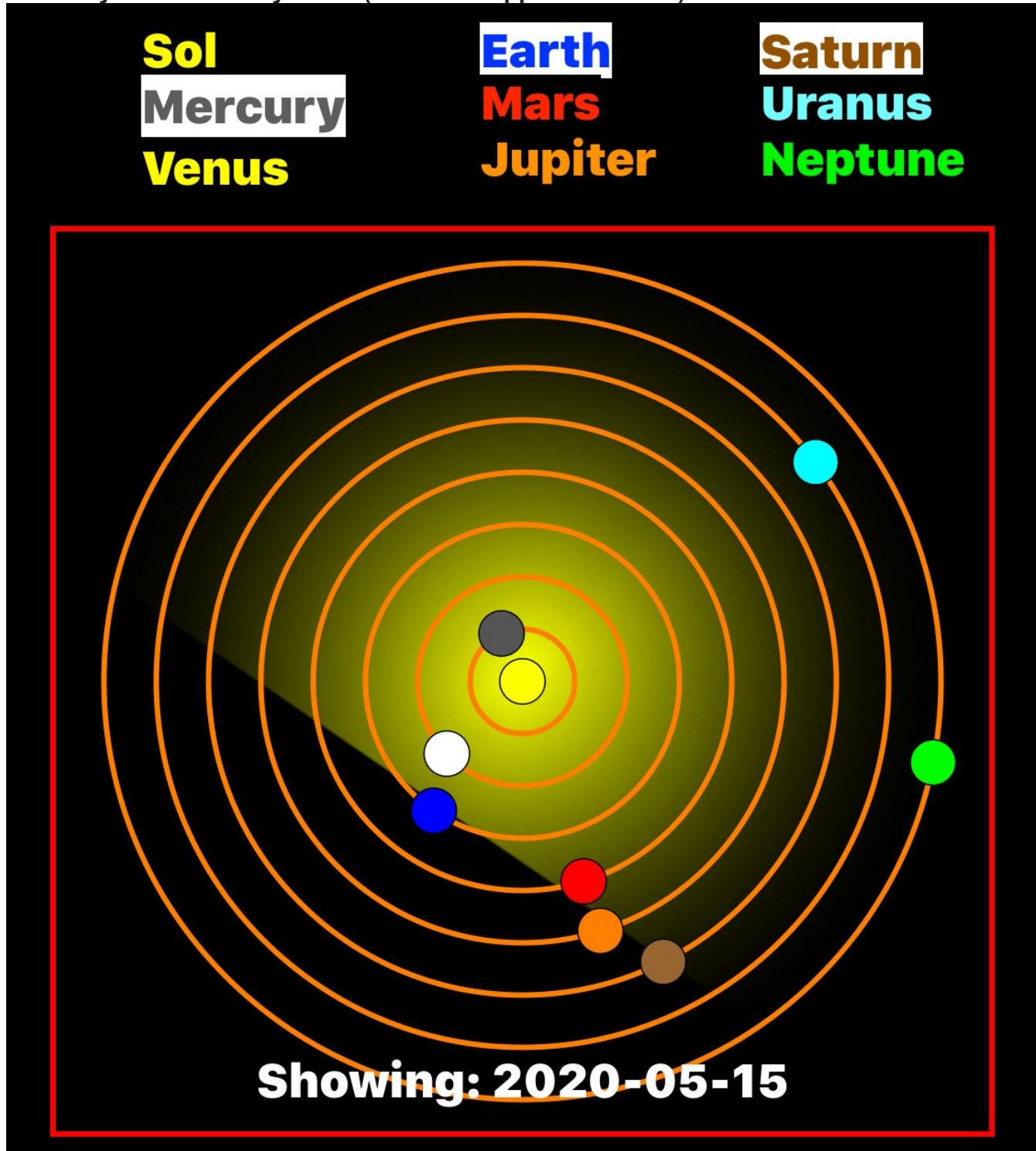
05/01/2020	2258
05/04/2020	1947
05/07/2020	1636
05/10/2020	1325
05/13/2020	1014
05/16/2020	0703
05/19/2020	0352
05/22/2020	0041
05/24/2020	2130
05/27/2020	1818
05/30/2020	1507

Sun/Moon Rise/Transit/Set Times

		Rise	Transit	Set
04/01/20	Sun	055819	124608	193419
	Moon	131232	201521	031234+
04/15/20	Sun	054619	124527	194455
	Moon	025415	084025	142736
04/31/20	Sun	053828	124646	195519
	Moon	040333	103932	171939

Planets:

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



- **Mercury:** Mercury is a morning object in the beginning of the month. It is illuminated at 76% and -0.35 apparent magnitude. Mercury rises at **0513** with the sun following at **0559**. Mercury



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by mid-month is rising at **0527** with Sol rising at **0546**. By the 31st Mercury is an evening object, setting at **2057** following sunset at **1955**.

- **Venus:** Is the Evening Star. Venus sets about **2249** on the first. By mid-month Venus is setting at **2203**. By the 31st Venus is setting at **2016**.
- **Mars:** Mars is an early morning object on the 1st of the month. Mars rises at **0228** on the first. By mid-month Mars is rising at **0202** but there is a waning crescent Moon rising right behind the Warrior at **0223** at 42% illumination. End-of-month finds the Warrior rising at **0130**. 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 **0100** and preceding sunrise at **0558**. Ol' Jove is also only about 2° from Pluto which rises at **0058**. By mid-month Jove is rising at **0006**. Come the end of month Jupiter is peaking above the horizon by **2258**.
- **Saturn:** Saturn is trailing Jupiter and leading the Sun, Saturn rises about **0117** on the 1st while sunrise is at **0558**. Saturn by mid month is rising by **0023**. By the end-of-the-month Saturn is rising at **2315**.
- **Uranus:** On the first Uranus doesn't rise until **0547**. The apparent magnitude is 5.88 so we're on the ragged edge of being naked-eye visible. The sun follows at **0558**. By the ides Uranus is rising at **0454**. End-of-month finds Uranus rising at **0354**.
- **Neptune:** Neptune is leading the Sun, rising at **0344** in the beginning of the month. You should be able to squeeze in a peek if you're up by that hour. By the 15th Neptune is rising at **0249**. By the end of the month Neptune is rising at **0147**.
- **Pluto:** Pluto rises by **0056** on the first of the month. By mid-month Pluto is rising by **0058**. By the 31st Pluto is rising at **2257**.

Asteroids:

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

- **eta Aquariids** – May 19th to May 28th (From: [American Meteor Society](#))
The Eta Aquariids are a strong shower when viewed from the southern tropics. From the equator northward, they usually only produce medium rates of 10-30 per hour just before dawn. Activity is good for a week centered the night of maximum activity. These are swift meteors that produce a high percentage of persistent trains, but few fireballs.
Shower details - Radiant: 22:32 -1° - ZHR: 40 - Velocity: 42 miles/sec (swift - 66.9km/sec) - Parent Object: 1P/Halley
Next Peak - The eta Aquariids will next peak on the May 4-5, 2020 night. On this night, the moon will be 91% full.
- 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.



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- Jupiter Type: The Jupiter types have a period less than or equal to 20-years.
- Short period comets May 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.

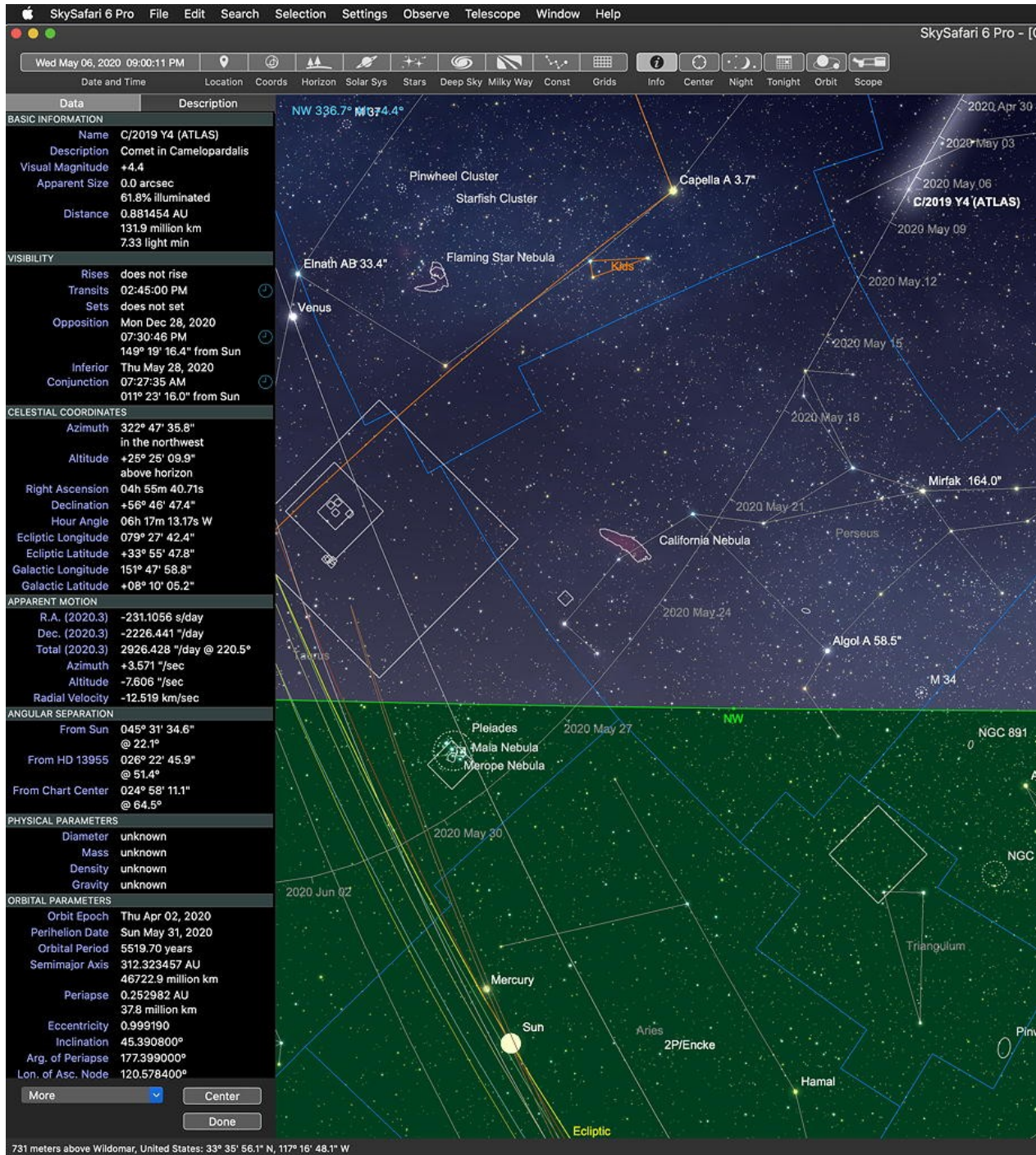
C/2019 Y4 (ATLAS), or **Comet ATLAS**, is a comet with a near-parabolic orbit, which was discovered by the ATLAS survey on December 28, 2019.



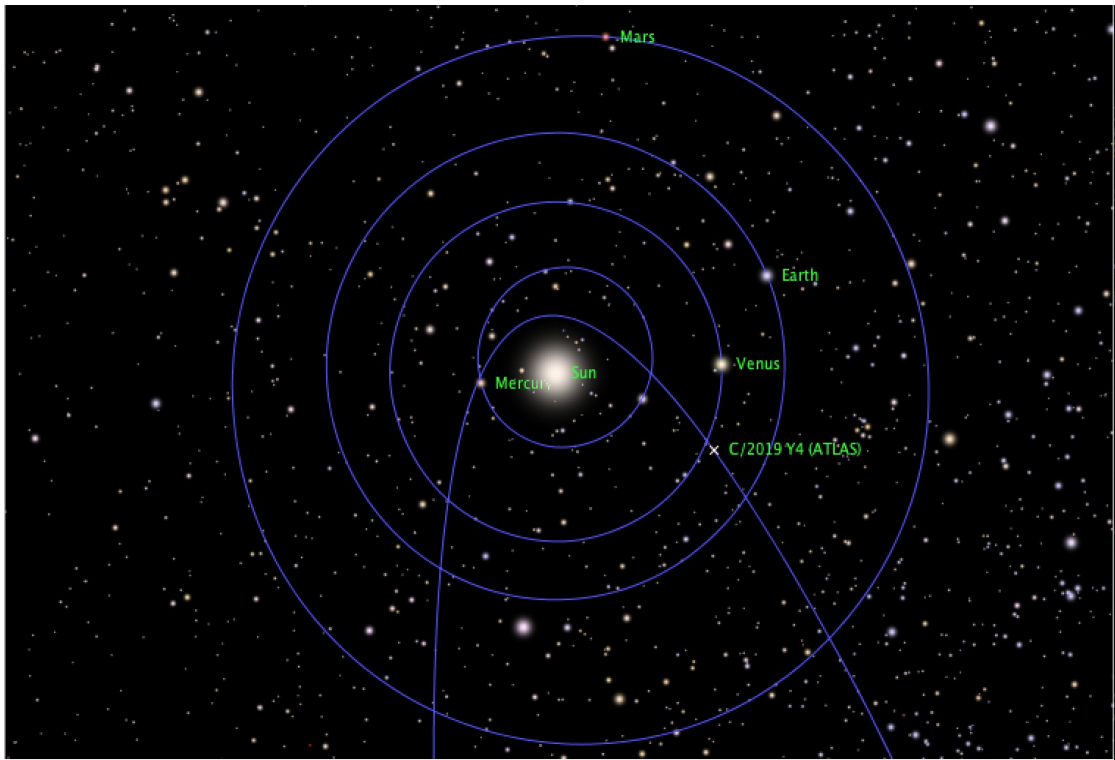
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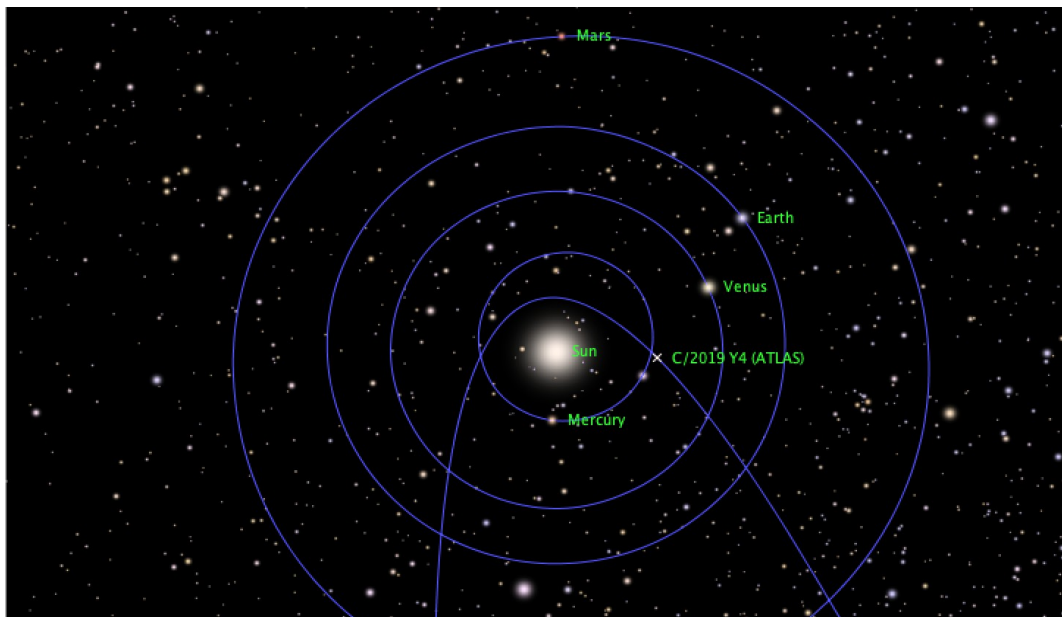
As of April 2, 2020 the comet may be disintegrating. C/2019 Y4 (ATLAS) is currently the brightest comet of 2020 and can be found in the constellation of Camelopardalis with binoculars or a telescope. It is expected that the comet will continue to brighten, and it is possible the comet may be visible to the naked eye sometime in April or May 2020. It will reach its nearest point to Earth on May 23 and come to perihelion (closest to the Sun) on May 31. ([Wikipedia](#))

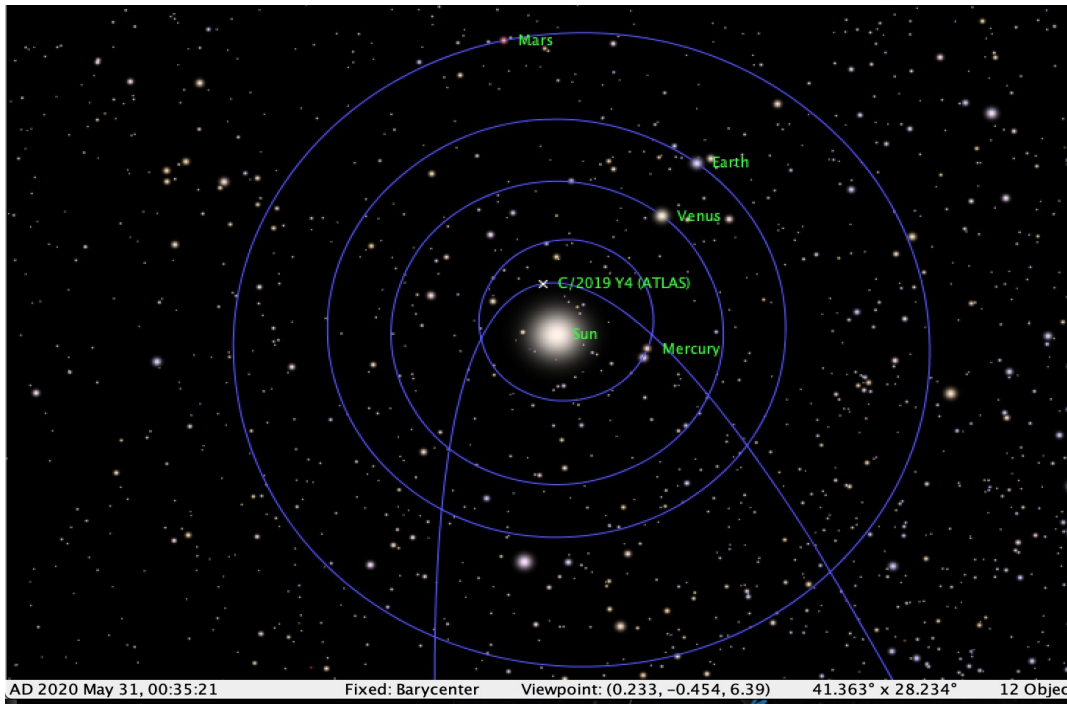


Position April 30 through June 02 2020

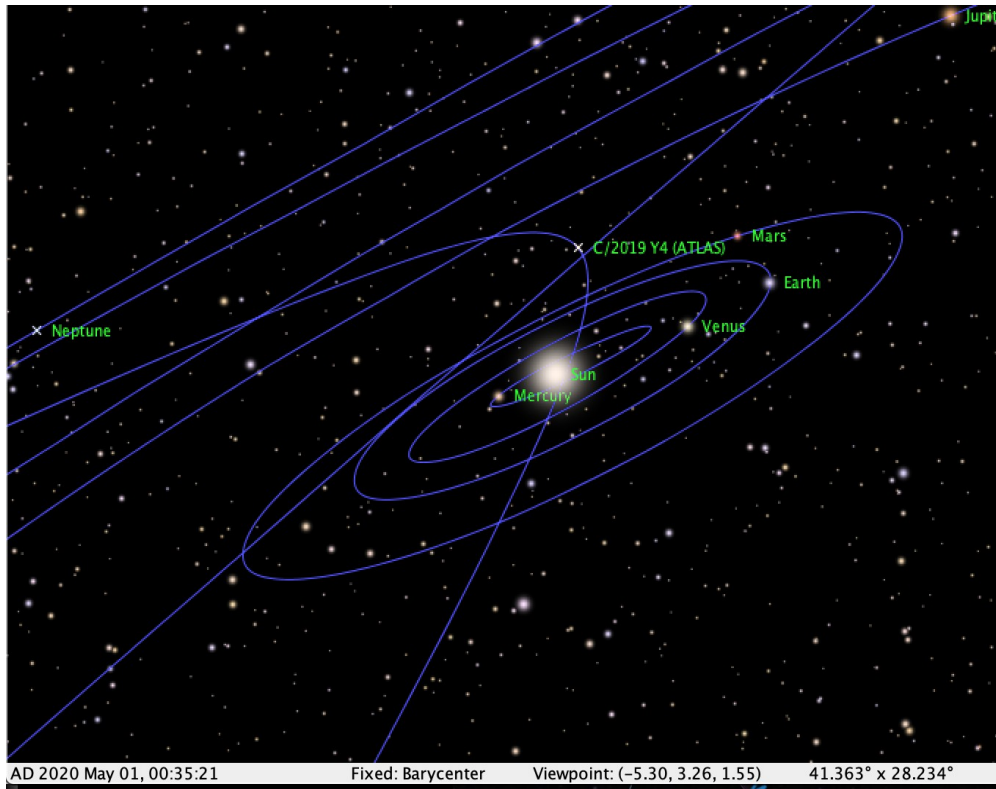


AD 2020 May 01, 00:35:21 Fixed: Barycenter Viewpoint: (0.233, -0.454, 6.39) 41.363° x 28.234° 12 Objects 202

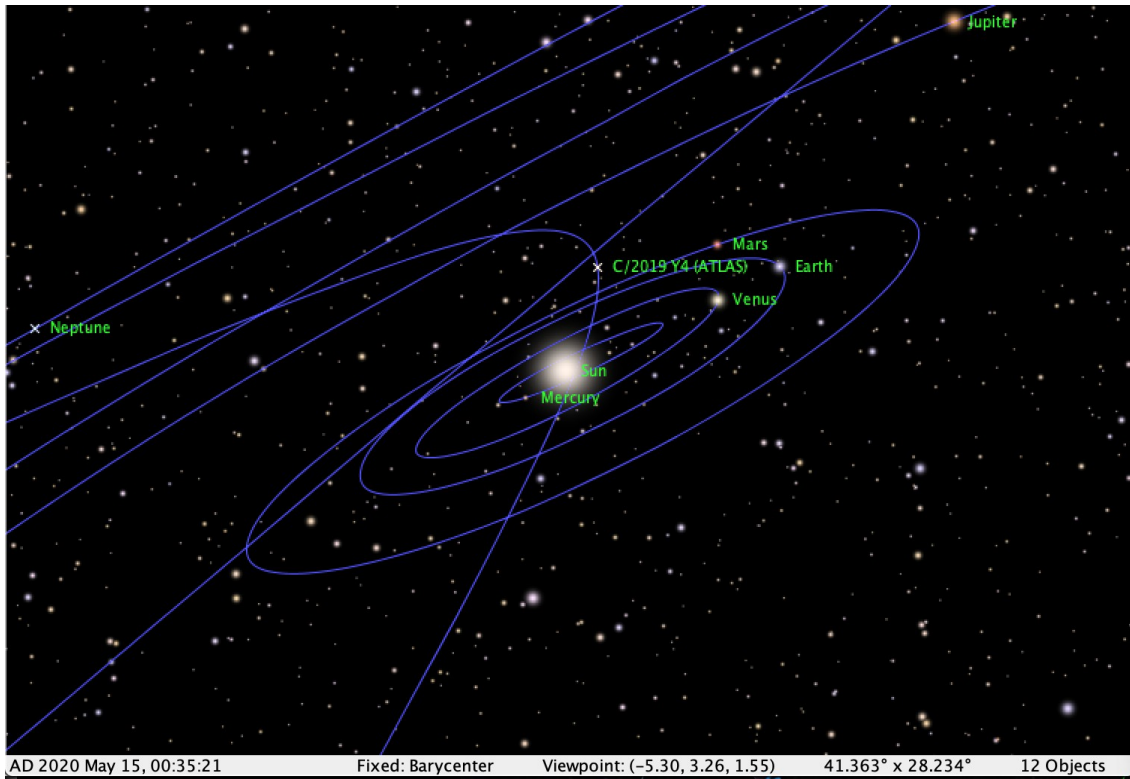




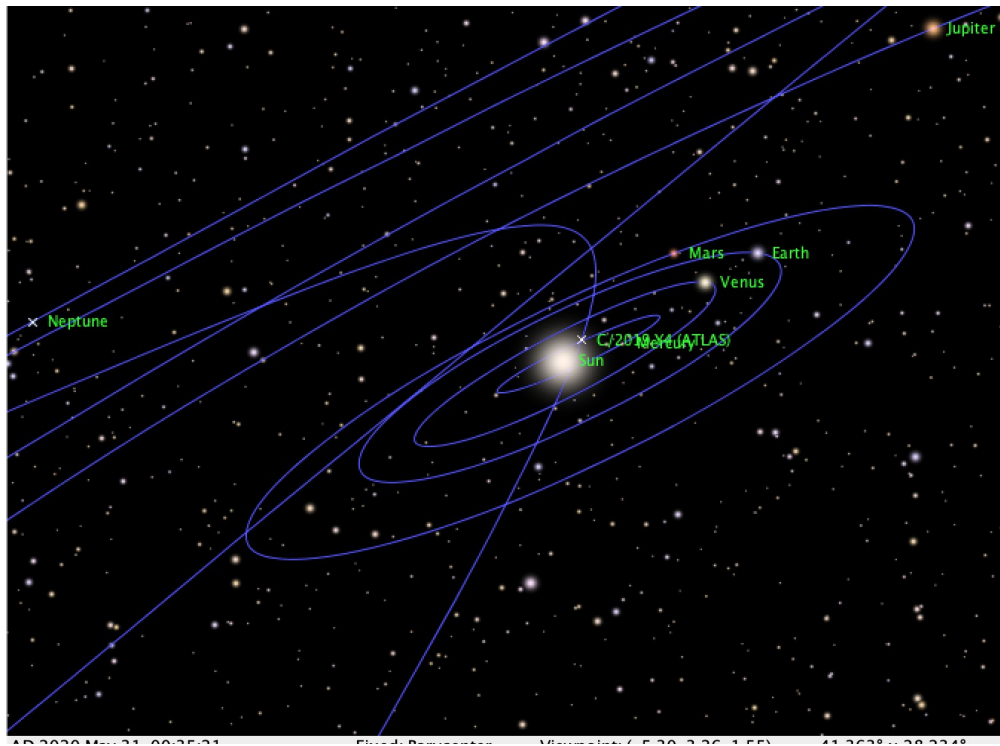
2020/05/31 @00:35:21 Looking down on Ecliptic from Solar North



2020/05/01 @00:35:21 Into The Ecliptic



2020/05/15 @00:35:21 Into the Ecliptic



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

- **The Gum Nebula**



*By Roberto Mura - Own work, CC BY-SA 3.0,
<https://commons.wikimedia.org/wiki/index.php?title=Gum+12&oldid=9972092>*

The **Gum Nebula (Gum 12)** is an emission nebula that extends across 36° in the southern constellations Vela and Puppis. It lies roughly 350 parsecs from the Earth. Hard to distinguish, it was widely believed to be the greatly expanded (and still expanding) remains of a supernova that took place about a million years ago. More recent research suggests it may be an evolved H II region. It contains the 11,000-year-old Vela Supernova Remnant, along with the Vela Pulsar.



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The Gum Nebula contains about 32 cometary globules. These dense cloud cores are subject to such strong radiation from O-type stars γ^2 Vel and ζ Pup and formerly the progenitor of the Vela Supernova Remnant that the cloud cores evaporate away from the hot stars into comet-like shapes. Like ordinary Bok globules, cometary globules are believed to be associated with star formation.

It is named after its discoverer, the Australian astronomer Colin Stanley Gum (1924–1960). Gum had published his findings in 1955 in a work called *A study of diffuse southern H-alpha nebulae* (see Gum catalog). (Wikipedia)

○ The Needle Galaxy:



By Ken Crawford - <http://www.imagingdeepsky.com/Galaxies/NGC4565/NGC4565.htm>, CC BY-NC 4.0 <https://commons.wikimedia.org/wiki/index.php?title=20092206>

NGC 4565 (also known as the **Needle Galaxy** or **Caldwell 38**) is an edge-on [spiral galaxy](#) about 30 to 50 million light-years away in the constellation Coma Berenices. It lies close to the North Galactic Pole and has a visual magnitude of approximately 10. It is known as the Needle Galaxy for its narrow profile. First recorded in 1785 by William Herschel, it is a prominent example of an edge-on spiral galaxy.



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NGC 4565 is a giant spiral galaxy more luminous than the Andromeda Galaxy. Much speculation exists in literature as to the nature of the central bulge. In the absence of clear-cut dynamical data on the motions of stars in the bulge, the photometric data alone cannot adjudicate among various options put forth. However, its exponential shape suggested that it is a barred spiral galaxy. Studies with the help of the Spitzer Space Telescope not only confirmed the presence of a central bar but also showed a pseudobulge within it as well as an inner ring.

NGC 4565 has at least two satellite galaxies, one of which is interacting with it. It has a population of roughly 240 globular clusters, more than the Milky Way.

NGC 4565 is one of the brightest member galaxies of the Coma I Group. ([Wikipedia](#))

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

For now – Keep looking up.





Become a Citizen Scientist with NASA!

by David Prosper

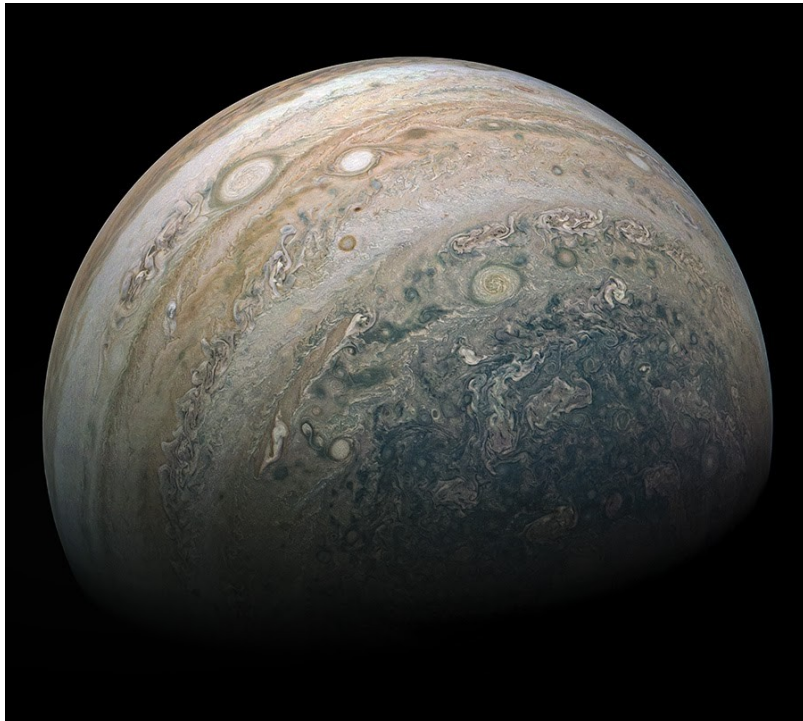
Ever want to mix in some science with your stargazing, but not sure where to start? NASA hosts a galaxy of citizen science programs that you can join! You'll find programs perfect for dedicated astronomers and novices alike, from reporting aurora, creating amazing images from real NASA data, searching for asteroids, and scouring data from NASA missions from the comfort of your home. If you can't get to your favorite stargazing spot, then NASA's suite of citizen science programs may be just the thing for you.

Jupiter shines brightly in the morning sky this spring. If you'd rather catch up on sleep, or if your local weather isn't cooperating, all you need is a space telescope - preferably one in orbit around Jupiter! Download raw images straight from the Juno mission, and even process and submit your favorites, on the **JunoCam** website! You may have seen some incredible images from Juno in the news, but did you know that these images were created by enthusiasts like yourself? Go to their website and download some sample images to start your image processing journey. Who knows where it will take you? Get started at bit.ly/nasajunocam

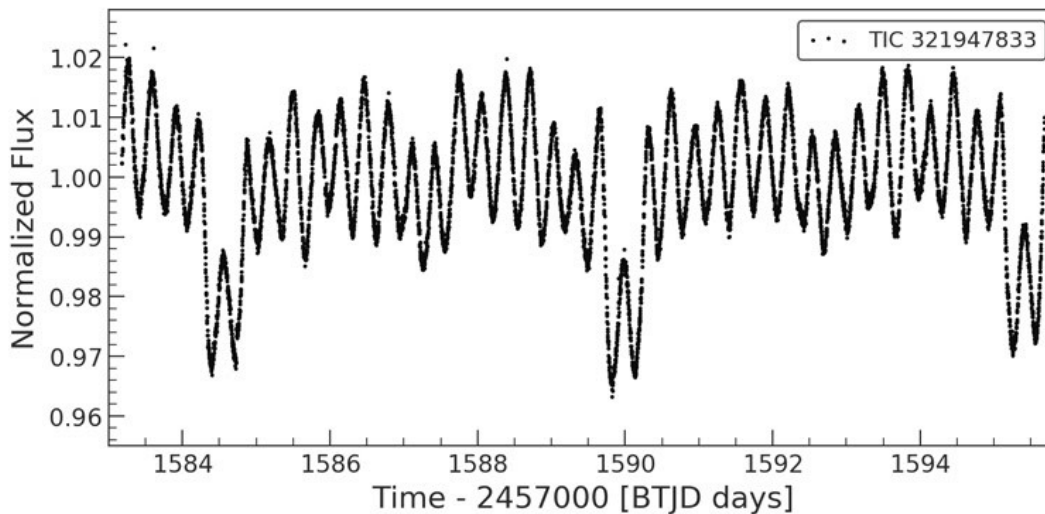
Interested in hunting for asteroids? Want to collaborate with a team to find them?? The **International Astronomical Search Collaboration** program matches potential asteroid hunters together into teams throughout the year to help each other dig into astronomical data in order to spot dim objects moving in between photos. If your team discovers a potential asteroid that is later confirmed, you may even get a chance to name it! Join or build a team and search for asteroids at iasc.cosmosearch.org

Want to help discover planets around other star systems? NASA's TESS mission is orbiting the Earth right now and scanning the sky for planets around other stars. It's accumulating a giant horde of data, and NASA scientists need your help to sift through it all to find other worlds! You can join **Planet Hunters TESS** at: planethunters.org

Intrigued by these opportunities? These are just a few of the many ways to participate in NASA citizen science, including observing your local environment with the GLOBE program, reporting aurora with Aurorasaurus, measuring snowpack levels, training software for Mars missions – even counting penguins! Discover more opportunities at science.nasa.gov/citizenscience and join the NASA citizen science Facebook group at facebook.com/groups/Sciencing/ And of course, visit nasa.gov to find the latest discoveries from all the research teams at NASA!



GREAT SOUTHERN JUPITER: Incredible image of Jupiter, submitted to the JunoCam site by Kevin M. Gill. Full Credits : NASA/JPL-Caltech/SwRI/MSSS/Kevin M. Gill



Light curve of a binary star system containing a pulsating (variable) star, as spotted on Planet Hunters TESS by user mhuten and featured by project scientist Nora Eisner as a “Light Curve of the Week.” Credit: Planet Hunters TESS/NASA/mhuten/Nora Eisner



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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](#).
