



# Celestial Observer

[www.aosny.org](http://www.aosny.org)

OFFICIAL NEWSLETTER

Summer 2021

## The Amateur Observers' Society of New York

### The Amateur Observers' Society

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The **Celestial Observer** is the Official Newsletter of the Amateur Observers' Society of NY, Inc. A 501(c)3 organization.

Visit us at [www.aosny.org](http://www.aosny.org) and join us on [Facebook](#).

The AOS expresses its deepest appreciation to the Custer Institute for hosting our Observatory, and the [Sierra Club Long Island Group](#) for the 20" telescope.



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## This Month's Issue

President's Message

July/August Observing Highlights

Member Eclipse Photos

**Next Meetings (online):** Sunday July 11th, 1:15PM  
(Due to Independence Day)

Contact [AOSSecretary@aosny.org](mailto:AOSSecretary@aosny.org) for a meeting invitation

## The President's Message

By Sue Rose

Were you fortunate enough to see the partial annular eclipse, that giant smiley face on the sunrise horizon, on June 10? It was fantastic. Member **George P** made a video from his view in Hampton Beach, NH, <https://vimeo.com/561759493>.

Here in NY, **Jason C**, due to his work connections, was able to arrange for the boards of AOS and AAA to meet up at the observation deck of the 4th tallest building in NYC which is not yet opened to the public. Not only did we get an outstanding view of the smiley face as it peeped over the horizon, but we shared it with the staff of the building and the **Senior Vice President of Operations, Mr. Williams**. The view before dawn of the nighttime city, overlooking the Chrysler Building and eye to eye with the observation deck of the Empire State Building, was amazing. And then, right on cue, and though the clouds, the horns of the crescent Sun made their appearance to the applause of all attending. The click-click of the many cameras

documenting the event along with all the oohs and ahhs was invigorating at such an early hour. We lost the ever-growing crescent to a thick cloud layer some time before completion, but no one was disappointed at the anticlimactic finish. How reminiscent of when young AOS members were able to make observations from the Empire State Building in the 60s.



Realizing that some astronomy was possible in the city, even with the light pollution, Mr. Williams suggested a

collaboration to inaugurate the world's tallest public observatory and hold regular viewings. We were in a glass enclosed area and there is an open-air floor above. He quickly wanted to know what telescopes would be best, what other equipment would be needed and how his staff could be trained. They have a very large LCD screen in the lobby, 20'x40' if I remember correctly, and he asked if images from the scopes could be transferred to it?



Absolutely! Can you imagine seeing an image of the Moon, Jupiter, or Saturn on such a screen? This will be the talk of the city and the in place to go, no doubt.

Thanks to Jason for having the foresight to suggest such an endeavor and to Mr. Williams and his staff for making it happen and having the vision to see where it can lead for the future. Stay tuned.

It seems that one of our members was on a plane that intercepted the actual path of annularity over Canada, that slim complete ring of sunlight surrounding the Moon. I've had the opportunity to see a few of these and, although it doesn't give you the spectacular darkness and streamers and temperature change and awesomeness of a total, it's still an astounding sight to behold. Celestial mechanics at work never gets dull. Congratulations **Craig S.** The aircraft was guided by a flight plan from the world's foremost eclipse path calculator, our own **Dr. Glenn S.** He did it again. Due to the closure of the Canadian border, this was the only way for non-natives to see the event. <https://skyandtelescope.org/astronomy-news/chasing-the-sun-at-39000-feet/> If you'd like to see the next nearby complete annular eclipse, visit the SW US on Oct 14, 2023.

We will consider a special AOS observing Award for everyone who saw this event so make sure that I have your name on the list. Please send me an email to that effect.

On June 6, our meeting attendees

were treated to detailed training on a computer program, the **Photographer's Ephemeris**, by the designer, **Mr. Stephen Trainor**. If you want to take astronomical, or any other photos, where the position and timing of the Sun and Moon and terrestrial objects can turn a standard photo into a WOW photo, you want to learn about this program. I discovered it many years ago and used it to plan AOS events, not necessarily photos. I actually used it to find an additional Manhattanhenge on a different date. Although I have suggested it to others many times through the years, I haven't used it myself in some time. I think I need to change that. Stephen has provided a 25% discount on the purchase of the full program to AOS members. Contact Jason or **Secretary Bill B** for information. Thanks Stephen.

On **June 20**, we were treated to a virtual tour of the VLA (Very Large Array) (the radio telescope west of Albuquerque in NM) by **Tyler Cohen & Montana Williams** of the National Radio Astronomy Observatory. The facility is massive and the way they move the antennas around is amazing. Whoever heard of wheels on a train turning sideways so they could make a turn? One of the great things about radio astronomy is that you don't have to wait for darkness, and you don't care about clouds. They probably get in more observing time than the visual scopes on HA or in Chile combined. Because there are 27 antennae that can be in different configurations at the same time, they perform multiple projects simultaneously. Anyone who can devise a proposal of worthy astronomical research can apply for time as this is a publicly funded facility. Attendees of the 2020 ALCON were to do this in person last year, then this year,

and hopefully next year. I hope this video version whet your whistle for the real thing and you can attend ALCon 2022 in Albuquerque, July 28-30, 2022. Trip to the VLA on July 31. Thank you, Tyler and Montana.

On July 11, no meeting July 4, **Professor Marc Gagne** of West Chester University, PA will discuss Black Holes—How do they form? Massive Star winds, magnetic fields, and the role of binarity on massive star evolution and supernovae. On July 18th, **Associate Professor Jacob Bean**, University of Chicago will discuss Maroon X—A radial velocity spectrograph for the Gemini Observatory.

**While our in-person meetings** don't have a restart date yet due to Covid restrictions at Hofstra University, I hope to see everyone at upcoming observing sessions. If anyone has additional ideas, or contacts, for possible meeting space, please contact me. Our special member-only observing permits are good for July 2, 3, 9, 10, 30 & 31, and Aug 6, 7 & 11. Make sure to carry your special AOS permit during these events, new amended version in the io files, and your membership card. Should the virus raise its' ugly head again, all restrictions will go back into effect. So, keep the old one and hope it never gets used. ●

***Friends are like stars.  
You don't always see them,  
but you know they are  
always there!***

Please, everyone, be safe and be careful. We will get together at some point. Till then,



## Annual AOS Picnic Change

The board has decided that, with the current uncertainty, we will not plan for our *typical* yearly picnic at the home of a member. We will, instead, plan a BYOF get together at a public location such as the beach, or perhaps at our observatory in Southold, on Aug 14 and combine with observing the Perseid Meteor Shower. Details on the hotline as we get closer. No plans yet for our yearly holiday party on December 11.

## Observing Sites

As we go to press, the Covid restrictions in NY have been mostly eliminated. It feels great to rejoin the real world and begin to see family and especially AOS friends. Let us hope we won't have a resurgence. Please do whatever you can to stay safe.

**Susan Rose Observatory** on the grounds of Custer Institute in Southold. **Director Bill C**, with help from **Jason C** and **Bill B**, has continued to bring the night sky objects into view for the public using digital means to project images captured by our C14 within the 8-foot dome to a monitor outside. He can always use extra help. Since this experiment has worked so well, and been well received by the visitors, we will be continuing to use this even after in-person viewing resumes. To that end, we have purchased new digital equipment. A generous donation from **Wendy & Ira L** and those received in memory of member **Bryan B**, an avid astrophotographer and twin brother of our **Corresponding Secretary Bill B**, will help to pay for these items. If anyone would like to donate toward this project, please contact **Treasurer Harvey M**.

**Sagamore Hill** is patiently awaiting our return to bring the night sky views back to their visitors as

is the new Jones Beach Nature & Energy Center. We are hoping that at some point in the not-too-distant future we will be back there with all our equipment and seeing the public once again.

## Stargazing in the NYS Parks

Permits are no longer available till Sept 7. Restrooms are not open during the cold months. The permit is good from Jan 1-Dec 31 each year and is for the vehicle, regardless of the number of occupants. Just be sure you have some star gazing equipment, like a star map. The permit allows you to go anytime you want which is a great advantage. It's a good idea to put a note on the hotline and let others know you're going so you might get some company, socially distanced of course. No eyepiece sharing. ALWAYS tell someone where you will be. You might also call the NYS Police at 631-669-2500 to let them know you'll be there. PLEASE, make sure it is in your cell phone.

## July/August Observing Highlights

(All observing sessions are members only)

Watch for the second apparition of Manhattanhenge on July 11 and 12 if you happen to be in NYC.

July 3 watch for Venus near M44, the Beehive Cluster in Cancer.

Earth will be at aphelion on July 5, it's furthest point from the Sun.

Watch for the Moon and planet dance near Mercury before sunrise July 8, near Mars & Venus July 12 in the evening, near Saturn at sunrise on July 24 and near Jupiter the following morning, near Mars before sunset on Aug 9, and Venus all day Aug 11 (a good time to try and see it during the day since you have a guidepost), it joins Saturn again before

sunrise Aug 20 & Jupiter on Aug 22.

Venus & Mars will be close on July 13. Watch for the Lunar X before the Moon sets on July 16. Saturn will reach opposition on Aug 2. That means it is directly opposite the Sun, crossing our Meridian at approximately midnight and making for the best viewing since you're looking through the least amount of atmosphere.

The Perseid Meteor Shower peaks the morning of Aug 12. Our special observing permit covers till dawn. This year promises to be particularly good for the Perseids, since the shower's peak will coincide with a dark, moonless sky.

See Mercury and Mars nearby after sunset on Aug 18.

## Observing Projects and Useful Websites

Keep the dates!

### Astronomical League's 75th Anniversary Challenge

Due to the timing of the mechanics of our Solar System, 2021 also coincides with almost a complete apparition of Jupiter (January 29, 2021 at 1213 through March 5, 2022). See details and requirements at <https://www.astroleague.org/content/al-observing-challenge-special-observing-award>

### Did you see the partial annular eclipse? Did you catch the eclipse bug? What a good excuse to travel and see the world.

Keep the dates-On Nov 19, 2021, watch for a near total lunar eclipse and May 16 & Nov 8, 2022 for total lunar eclipses. If you don't mind the cold, you can travel to the Antarctic on Dec 4, 2021 for a total solar eclipse or maybe try a cruise <https://www.chimuadventures.com/en-au/antarctica/ocean-endeavour-solar-eclipse-voyage>. Contact James

McAloon at [james.mcalloon@chimuadventures.com](mailto:james.mcalloon@chimuadventures.com). On April 20, 2023, there's a hybrid solar eclipse over Australia/Indonesia, <https://siriustravel.com/solar-eclipse-tours/2023-western-australia-total-solar-eclipse-tour/>. On Oct 14, 2023, there will be an annular solar eclipse over the south and mid-west US, only partial here in NY. On April 8, 2024, the US will once again be treated to a total solar eclipse, this time stretching from Mexico, up through the center of the country over Buffalo, into Canada, etc. The Moon will nearly cover the Sun from here on Long Island, but with the totality path sooooo close, why wouldn't you travel? Don't miss this one. It's time to start making plans. Who wants to help with this? Contact Sue. Our San Antonio contingent, **John E**, will be in great position for the last 2. See more info at <https://www.greatamericaneclipse.com/future-eclipses/eclipseglobe>.

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Luckily, the partial annular on June 10, 2021 will be visible locally at sunrise. We will be there.

### Observing Projects for Month

[The Sky Scrapers this month](#)

[Skymaps.com](https://www.skymaps.com)

[The Night Sky This Month](#)

[In-the-Sky.org](https://www.in-the-sky.org)

[Astronomy Mag Sky This Week](#)

[Sky & Telescope Magazine Sky at a Glance](#)

[Globe at Night](#)

[EarthSky](#)

[What's Up each month \(video\)](#)

[Tonight's Sky](#)

[Comet Watch 2021](#)

### Constellation Hunter Observing Program with Sue Rose

So far, I've included the following constellations-Andromeda, Antlia, Aries, Auriga, Bootes, Canes Venatici, Canis Major & Minor, Cassiopeia, Cancer, Coma Berenices, Corona Borealis, Corvus, Crater, Gemini, Hercules, Hydra, Leo Major & Minor, Lepus, Lynx, Monoceros, Orion, Pegasus, Perseus, Pyxis, Sagittarius, Scorpius, Sextans, Taurus, Triangulum, Ursa Major & Minor, Virgo and the Summer Triangle of Aquila, Cygnus and Lyra. If you'd like to catch up, you can find my posts in the hotline messages or send me an email. Let's hope we can get together at our new location and work on these together. Download and print the constellation charts from <https://www.iau.org/public/themes/constellations/> so you can see which stars are within the boundaries.

### ALCON Update

The Astronomical League has postponed the in-person event planned for Albuquerque this August till 2022. They will be hosting an online series of presentations Aug 19-21. Registration for our virtual convention is now open at the following link. IT'S FREE!! \$5 if you want a pin commemorating the Astronomical League's 75th Anniversary. The convention features virtual tours, professional and youth speakers, a Slooh presentation, all 2020 and 2021

youth and general award presentations, over \$3,000 in door prizes donated by our member clubs, our League business meeting, an international star party, and a keynote address by Dr. Jocelyn Bell Burnell, discoverer of pulsars. To be eligible, you must register your name and email address. It only takes a minute to do, and League membership is not required. <https://www.alconvirtual.org>

### New Citizen Science Projects

Searching for galaxies which look like jellyfish is a new Citizen Science project for 2021. Jellyfish Galaxies research <https://www.zooniverse.org/projects/apillepich/cosmological-jellyfish/about/research>

NASA is asking citizen scientists to help hunt exoplanets in the vast trove of images gathered by the Transiting Exoplanet Survey Satellite. <https://tinyurl.com/4h5mkjt4>

### Northern Lights Trip

Ever want to visit Iceland and see the northern lights and volcanoes and other geothermal features? We had discussed making a club trip just before the pandemic broke so maybe it's time to try again. Anyone want to help organize? [Learn more about a tour he's already arranged](#). Maybe we could get a group rate? Contact **Sue Rose**.

### RSSP Update

The Rockland Summer Star Party has been rescheduled for 2022.

### Stellafane 2021

The Stellafane convention will take place this year, August 5-8, 2021. Visit <https://stellafane.org/convention/2021/index.html> for details. However, the article clearly states that things will be different this year and much is

subject to change.

## Explore Scientific's Online Presentations

<https://youtu.be/bOzZjO8QWfc>

## Hamptons Observatory

Remember when Comet Shoemaker-Levy collided with Jupiter? Well, on July 12th at 7:00 PM, David H. Levy will discuss that event, his many other discoveries and his career in astronomy, as described in his latest book, "A Nightwatchman's Journey" (those who'd like to order an auto-graphed copy may contact David at [jarnacq@outlook.com](mailto:jarnacq@outlook.com)). Further info and registration info about this free, virtual event may be found on our website. [www.HamptonsObservatory.org](http://www.HamptonsObservatory.org),

## The Best Places to Go Stargazing Around the World

Dark skies and bright stars are the main attraction at the top stargazing spots around the world. <https://tinyurl.com/cahk9xpk> According to Travel & Leisure Magazine, Virginia is for astronomy lovers and is the best state on the east coast as 5 dark sky parks prove, <https://tinyurl.com/2x37dhj5>. I guess **George & Verna Saar** knew what they were doing when they moved last year. More observing reports needed, George. T&L also shows an underrated stretch of Route 66 that has some of the best stargazing in the US, <https://tinyurl.com/2jnsst97>.

**The Best RV Campgrounds Near Dark Sky Destinations** can be found here <https://togorv.com/rv-living/dark-sky-rv-campgrounds/>.

**Are you a deep thinker?** What are the TRUE limits of humanity? What is the final border that we will never cross? <https://www.youtube.com/watch?v=uzkD5SeuwzM> Maybe

you'd like to find out what it's really like to stargaze at a dark sky reserve-<https://tinyurl.com/28eyewmt>.

## Space Adventures-Commercial Spaceflight in 2021

<https://spaceadventures.com/blog-commercial-spaceflight-in-2021/> Opportunities for private citizens to fly to space are only going to increase in the coming years. Flights fall into two broad categories - flights of a few minutes (suborbital spaceflight), or flights of a few days (orbital spaceflight). If you see a spaceflight in your own future, it is never too early to talk. [jake@spaceadventures.com](mailto:jake@spaceadventures.com)

## New Technology enhances a 100-year-old Eclipse Photo

During the total solar eclipse of May 29, 1919, Sir Arthur Eddington photographed the eclipsed Sun and surrounding starfield showing stars which were actually located behind the Sun, thereby proving Einstein's Theory of Relativity, that space is distorted around massive gravitational objects, and so can bend light. <https://mailchi.mp/06cc3291fc99/great-1919-solar-eclipse-highest-res-image-update-gtr-confirmation?e=44bab75638>. Try it during the next total eclipse, April 2023 or 24.

## Astronomers Without Borders

Starting July 2, 2021, the price of our exclusive OneSky telescope will be increased to \$249.00 due to inflation in shipping and manufacturing costs. Until that date the price will be \$199.00. For over 10 years, this generous on-going funding program from Celestron has given AWB the opportunity to sell this versatile telescope at a reasonable price to

financially support our various observing, resources giving and outreach programs. Consider purchasing one for yourself or a family member to show your support. <https://shop.astronomerswithoutborders.org/collections/frontpage/products/awb-onesky-reflector-telescope>

## CubeSats in low-Earth orbit (LEO)

Arizona State University - LightCube is an education mission to allow a CubeSat in low-Earth orbit (LEO) to be easily operable by members of the general public. The LightCube CubeSat will provide a platform that increases the number of individuals who can participate in space activities. Specifically, anyone with appropriate amateur radio licensing within their jurisdiction and commercial radio equipment available for purchase for less than fifty dollars will be able to telecommand LightCube. The LightCube CubeSat will respond with a flash visible to the naked eye of the commander. In the process of operating LightCube, the user will inevitably learn important science, technology, engineering, and math (STEM) concepts in areas such as telecommunications, spacecraft design, atmospheric and climate science, and orbital mechanics.

## Sun Science Stamps Highlight a Decade of Sun-Watching from Space

To start off the summer, the U.S. Postal Service issued a set of stamps highlighting views of the Sun from NASA's Solar Dynamics Observatory. Showcasing a range of solar activity seen by the spacecraft, the stamps celebrate a decade of Sun-watching for this workhorse mission. The Sun Science stamps were issued by the U.S. Postal Service during a

ceremony at the Greenbelt Main Post Office in Maryland on June 18. <https://www.nasa.gov/feature/goddard/2021/sun-science-stamps-highlight-a-decade-of-sun-watching-from-space>

"It's such a pleasure to see these gorgeous stamps," said Dr. Nicky Fox, Division Director for NASA's Heliophysics Division at NASA Headquarters in Washington, D.C. "I look at each of these pictures

from the Solar Dynamics Observatory and am reminded of how they help us learn more about the Sun and the way its constantly changing atmosphere can affect Earth and the planets. I'm pleased that this imagery will be shared by the Postal Service with the whole country."

The U.S. Postal Service issued the below set of postage stamps highlighting views of the Sun from

NASA's Solar Dynamics Observatory on June 18, 2021. Credits: U.S. Postal Service

**Digital Library Free ebooks form NASA in PDF**

<https://www.nasa.gov/content/goddard/hubble-e-books>

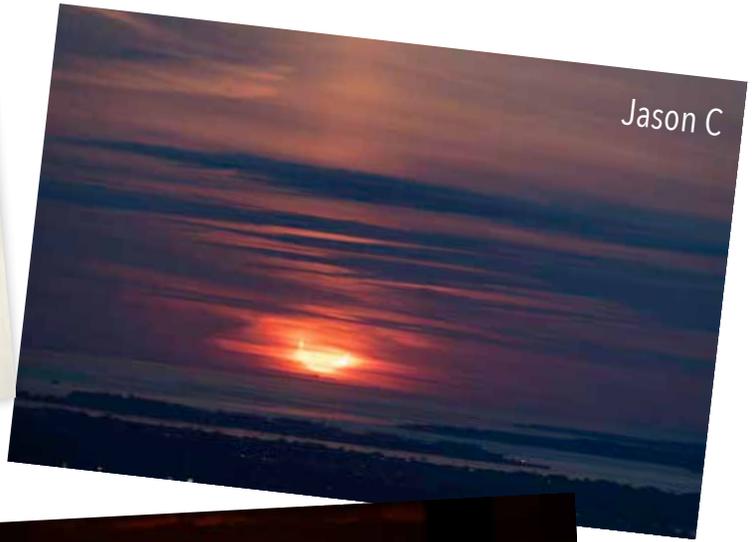
**World Science Festival and free Astronomy Courses**

<https://www.worldsciencefestival.com/>





Chris K



Jason C



John K



Steven B



Rich T



Bill C



Steve B



## Observe the Milky Way and Great Rift

By David Prosper

Summer skies bring glorious views of our own Milky Way galaxy to observers blessed with dark skies. For many city dwellers, their first sight of the Milky Way comes during trips to rural areas - so if you are traveling away from city lights, do yourself a favor and look up!

To observe the Milky Way, you need clear, dark skies, and enough time to adapt your eyes to the dark. Photos

rises in the southeast as marked by the constellations Scorpius and Sagittarius. Take note that, even in dark skies, the Milky Way isn't easily visible until it rises a bit above the horizon and the thick, turbulent air which obscures the view. The Milky Way is huge, but is also rather faint, and our eyes need time to truly adjust to the dark and see it in any detail. Try not to check your phone while you wait, as its light will reset your night



The Great Rift is shown in more detail in this photo of a portion of the Milky Way along with the bright stars of the Summer Triangle. You can see why it is also called the "Dark Rift." Credit: NASA / A.Fujii

of the Milky Way are breathtaking, but they usually show far more detail and color than the human eye can see - that's the beauty and quietly deceptive nature of long exposure photography. For Northern Hemisphere observers, the most prominent portion of the Milky Way

vision. It's best to attempt to view the Milky Way when the Moon is at a new or crescent phase; you don't want the Moon's brilliant light washing out any potential views, especially since a full Moon is up all night.

Keeping your eyes dark adapted is

The Great Rift is shown in more detail in this photo of a portion of the Milky Way along with the bright stars of the Summer Triangle. You can see why it is also called the "Dark Rift." Credit: NASA / A.Fujii



especially important if you want to not only see the haze of the Milky Way, but also the dark lane cutting into that haze, stretching from the Summer Triangle to Sagittarius. This dark detail is known as the Great Rift, and is seen more readily in very dark skies, especially dark, dry skies found in high desert regions. What exactly is the Great Rift? You are looking at massive clouds of galactic dust lying between Earth and the interior of the Milky Way. Other "dark nebulae" of cosmic clouds pepper the Milky Way, including the famed Coalsack, found in the Southern Hemisphere constellation of Crux. Many cultures celebrate these dark clouds in their traditional stories along with the constellations and Milky Way.

Where exactly is our solar system within the Milky Way? Is there a way to get a sense of scale? The "Our Place in Our Galaxy" activity can help you do just that, with only birdseed, a coin, and your imagination: [bit.ly/galaxyplace](https://bit.ly/galaxyplace). You can also discover the amazing science NASA is doing to understand our galaxy - and our place in it - at [nasa.gov](https://nasa.gov).

Discover more about our stellar neighborhood at [nasa.gov](https://nasa.gov)! 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 [nightsky.jpl.nasa.gov](https://nightsky.jpl.nasa.gov) to find local clubs, events, and more!

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## Virgo's Galactic Harvest

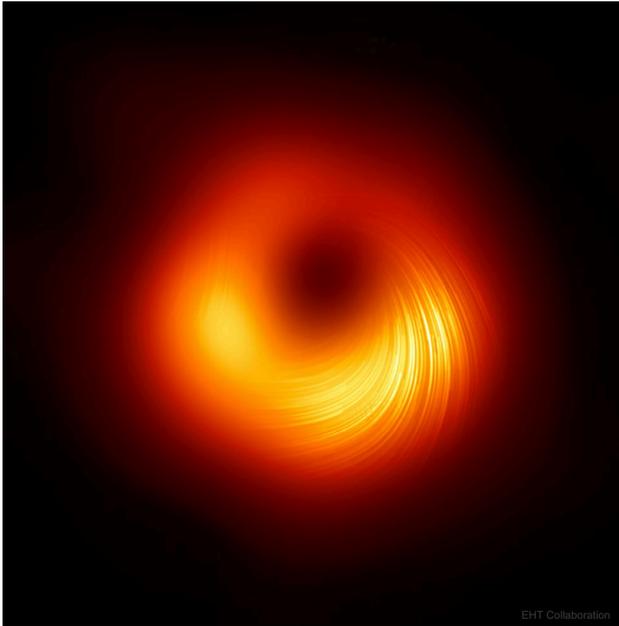
David Prosper

May is a good month for fans of galaxies, since the constellation Virgo is up after sunset and for most of the night, following Leo across the night sky. Featured in some ancient societies as a goddess of agriculture and fertility, Virgo offers a bounty of galaxies as its celestial harvest for curious stargazers and professional astronomers alike.

Virgo is the second-largest constellation and largest in the Zodiac, and easily spotted once you know how to spot Spica, its brightest star. How can you find it? Look to the North and start with the Big Dipper! Follow the general curve of the Dipper's handle away from its "ladle" and towards the bright orange-red star Arcturus, in Boötes – and from there continue straight until you meet the next bright star, Spica! This particular star-hopping trick is summed up by the famous phrase, "arc to Arcturus, and spike to Spica."

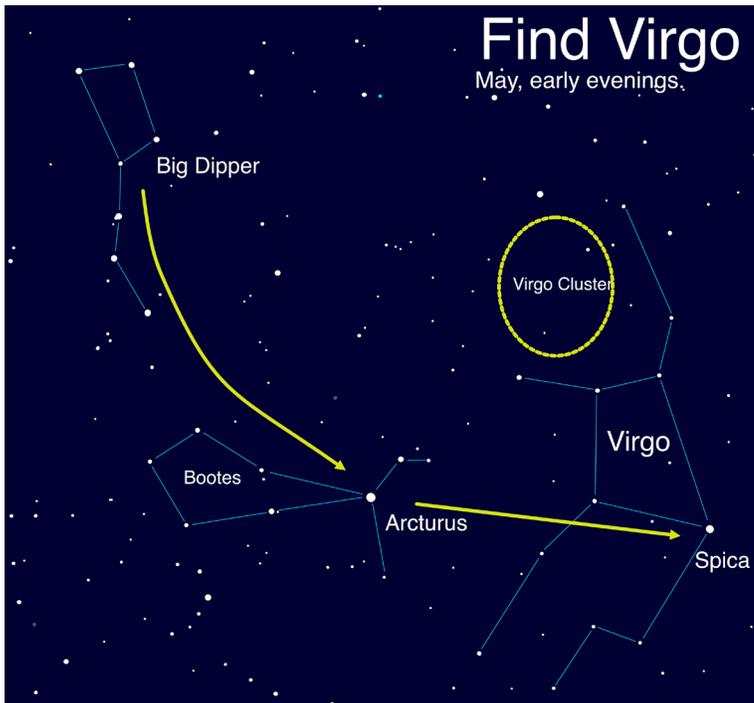
This large constellation is home to the Virgo Cluster, a massive group of galaxies. While the individual stars in Virgo are a part of our own galaxy, known as the Milky Way, the Virgo Cluster's members exist far beyond our own galaxy's borders. Teeming with around 2,000 known members, this massive group of galaxies are all gravitationally bound to each other, and are themselves members of the even larger Virgo Supercluster of galaxies, a sort of "super-group" made up of groups of galaxies. Our own Milky Way is a member of the "Local Group" of galaxies, which in turn is *also* a member of the Virgo Supercluster! In a sense, when we gaze upon the galaxies of the Virgo Cluster, we are looking at some of our most distant cosmic neighbors. At an average distance of over 65 million light years away, the light from these galaxies first started towards our planet when the dinosaurs were enjoying their last moments as Earth's dominant land animals! Dark clear skies and a telescope with a mirror of six inches or more will reveal many of the cluster's brightest and largest members, and it lends itself well to stunning astrophotos.

Virgo is naturally host to numerous studies of galaxies and cosmological research, which have revealed much about the structure of our universe and the evolution of stars and galaxies. The "Universe of Galaxies" activity can help you visualize the scale of the universe, starting with our home in the Milky Way Galaxy before heading out to the Local Group, Virgo Cluster and well beyond! You can find it at [bit.ly/universeofgalaxies](https://bit.ly/universeofgalaxies). You can further explore the science of galaxies across the Universe, along with the latest discoveries and mission news, at [nasa.gov](https://nasa.gov).



The first image of a black hole's event horizon was taken in the center of one of the most prominent galaxies in Virgo, M87! This follow up image, created by further study of the EHT data, reveals polarization in the radiation around the black hole. Mapping the polarization unveils new insights into how matter flows around and into the black hole - and even hints at how some matter escapes! More details: [apod.nasa.gov/apod/ap210331.html](https://apod.nasa.gov/apod/ap210331.html)

Credit: Event Horizon Telescope Collaboration



Find Virgo by “arc-ing to Arcturus, then spiking on to Spica.” Please note that in this illustration, the location of the Virgo Cluster is approximate - the borders are not exact.