The Eyepiece

SW. FL Astronomical Society, Inc.
3236 Forum Blvd #1160
Fort Myers, FL 33905

M104 - The Sombrero Galaxy
by Dick Cogswell

Editor - Mike Jensen

Once again this month's issue is absolutely FILLED with these incredible astrophotographs from our Astro SIG group! 16 images representing nights and nights of imaging, hours and hours of bleary eyed processing, and many head scratching moments when things don't go exactly right (sometimes followed by a G & T or some amber liquid).

We have two groups of members that represent the heart and soul of SWFAS. The Outreach Team and the Astrophotographers. As our Outreach season comes to a close we extend many thanks to Brian & Joe and many others who man the booths and put on the star parties. We sincerely appreciate the work of Tom Segur and his team for their work at the Observatory and solar viewing around Punta Gorda and Port Charlotte.

My personal thanks to the many members of the Astro SIG group who keep me inspired, help me research issues as well as share some good meals and fun. Seriously folks, you haven't lived until you've watched the night sky with them!

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Cold Welding: In the vacuum of space, two pieces of the same metal, if perfectly smooth, can bond permanently because there's no atmospheric oxygen to create a layer of oxidation.

Monthly Meetings

Our monthly meetings are held on the **first Thursday of each month**. **The meetings begin at 7:00pm**.

Here is the Zoom link:

https://zoom.us/j/94009412719?pwd=EQeRQtGAZplH-NiZacpY8fNM464tZwa.1

Meeting ID: 940 0941 2719
Passcode: 576794

Each meeting is usually a combined live and Zoom meeting.

The in person meeting is held at:
Calusa Nature Center/Planetarium
3450 Ortiz Ave,
Fort Myers, FL 33905

Below are the next three dates for the meetings of 2025:
May 1, 2025
June 5, 2025
July 3, 2025

Astro Sig Schedule 2025

All Meetings at 7:00pm

May 20, 2025
June 17, 2025

ASTRO SIG MEETING ZOOM LINK
NEW LINK

https://zoom.us/j/95463483537?pwd=6EprbaLEuVacLvRgBTVxehkTGh1WSP.1

Meeting ID: 954 6348 3537
Passcode: 052283

Seahawk Park Star Parties 2025

The SWFAS (Southwest Florida Astronomical Association) members will be utilizing astronomical equipment such as telescopes for observations from sunset to 2:00 am.

Dates for planned Seahawk public observing events in 2025 are as follows:

- **May 24**
- **September 20**
- **October 18**
- **November 15**
- **December 13**

These sessions must not interfere with Seahawk Club activities and can only begin after

Seahawk members have cleared the field.
Setup should wait for sunset. Stay on grass or concrete areas. Do not drive beyond the parking area and stay off the paved runway.
A small flashlight may be needed to override a photocell on a spotlight by the parking area.

2025 Observatory & Solar Dates

Below are the new schedules for the FSW Observatory and the Solar Observing events for the coming school year. Note that the observatory events will be the fourth Friday of each month, and the Solar observing events will be the second Saturday of each month at the indicated parks in Charlotte County.

FSW Observatory	Solar Observing	Park
May 23, 2025	May 10, 2025	Gilchrist

President's Message

Brian Risley

We finally got a Seahawk Park Star Party in April. The 26th was clear (a little hazy) but we had about 20 people come out for it. Sky was a bit turbulent and also bright. Had a number of new members come out. The Earth Day event at the CNCP on the 19th was good. Had a number of sunspots and prominences visible, but it was hot!

We are winding down observing events for this season. We have Gilchrist Park Solar observing on the 10th in Punta Gorda, FSW Moore Observatory viewing on the 23rd and another Seahawk Park Star Party on the 24th. We then will be on hiatus until after the heat/rain/mosquitoes of the summer.

Our speaker this month (MAY 1ST 7PM) is member Dr. Mario Motta talking about the Spring Galaxies. Next month, our own Joe Dermody talking about NASA!

NGC 3344 By Dr. Mario Motta

Club Officers & Positions

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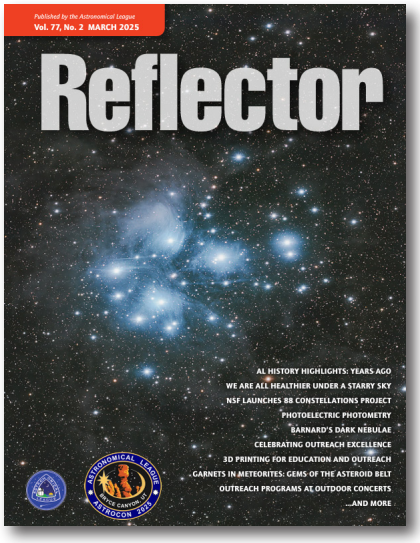
The Astronomical League

As a member of the Southwest Florida Astronomical Society you are automatically also a member of the Astronomical League, a nationwide affiliation of astronomy clubs. Membership in the AL provides a number of benefits for you including receipt of The Reflector, the AL's quarterly newsletter, use of the Book Service, through which you can buy astronomy related books at a 10% discount. You can also participate in the Astronomical League's Observing Clubs. The Observing Clubs offer encouragement and certificates of accomplishment for demonstrating observing skills with a variety of instruments and objects. These include the Messier Club, Binocular Messier Club, the Herschel 400 Club, the Deep Sky Binocular Club, and many others. To learn more about the Astronomical League and its benefit s for you, visit http://www.astroleague.org

Reflector Magazine

The latest – March 2025 - edition of the Reflector magazine was emailed on March 12. It is also available via the web at https://www.astroleague.org/reflector



What's up with the Astronomical League – April 2025

The link to the latest happenings is at : https://mail.google.com/mail/u/0/#search/astronomical+league/FMfcgzQZVKGkWggRTxSRNMzQWSbNKpMM

Monthly highlight of the Astronomical League Observing Programs (Article prepared by SWFAS Astronomical League Coordinator John MacLean)

The Astronomical League Planetary Nebula Observing Program

Planetary nebulae are among the most interesting deep sky objects available to the amateur observer and are a frequent target at our star parties.

The complete observing list includes 110 objects, all viewable from southern Florida, ranging from well known, spectacular objects like the Ring and Dumbbell nebulae to challenging, star-like points of light in crowded star fields.

Two levels of awards are available. The Basic level certificate requires the successful observation of a minimum of 60 nebulae accessible with modest instruments in less than dark skies. The Advanced level certificate requires an attempt at all 110 objects. A minimum of 90 objects must be successfully imaged for the Imaging award. The use of computerized Go-To technology is allowed.

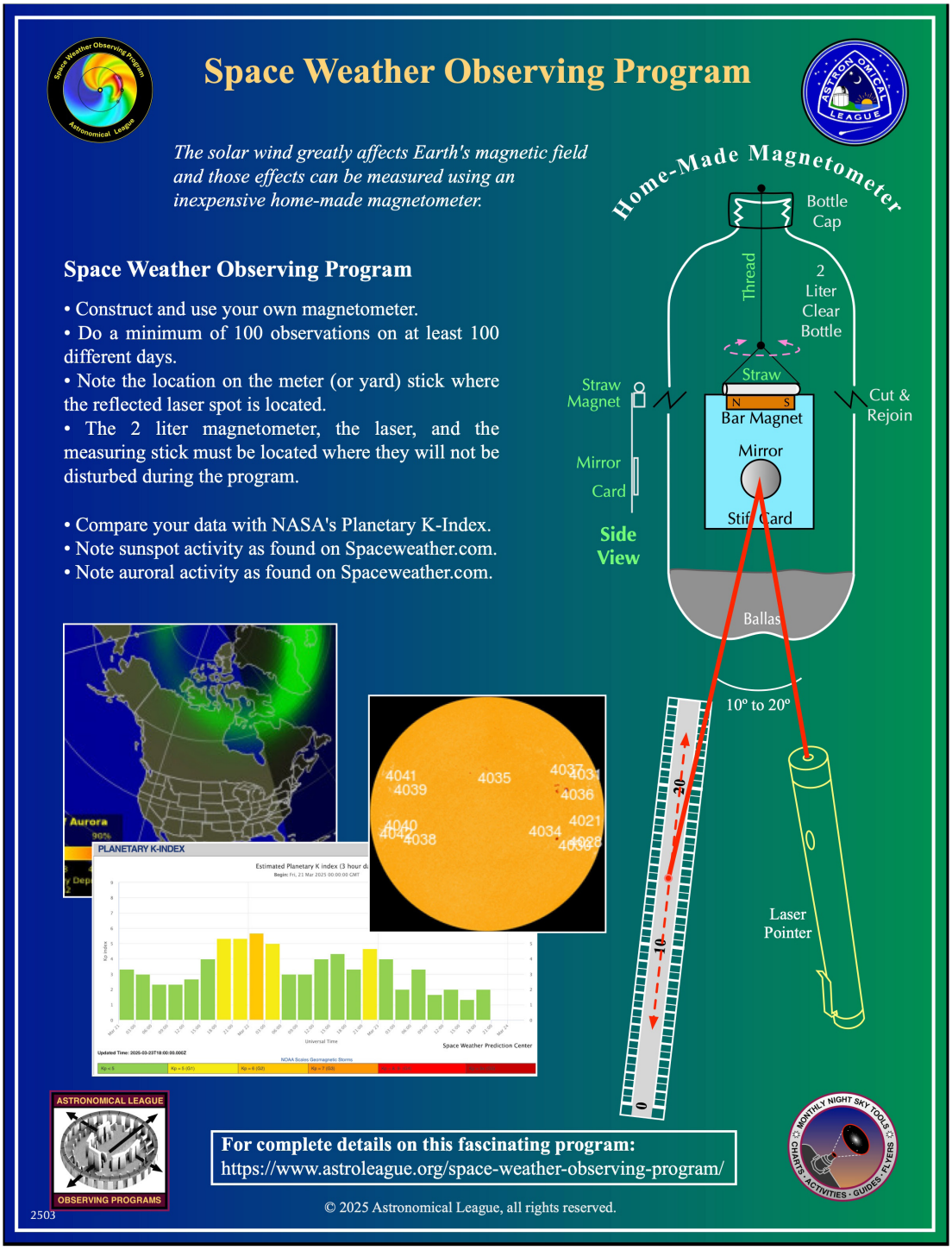
To assist with completing the programs, the League has the "Planetary Nebula Observing Guide" available via the League bookstore for $17. The Guide includes images of all 110 objects along with an introduction and historical background.

Tackling this program is an excellent way to learn about "what makes stars tick" and relate that knowledge to specific objects in the sky. This can't help but make nights at the telescope that much more enjoyable.

What's Up Doc? Newsletter

For individuals participating in any of the Astronomical League's Observing Programs, a very useful resource is provided by Aaron Clevenson's What's Up Doc monthly Newsletter and Observing Spreadsheet. Access via the following link: [What's Up Doc | The Astronomical League (astroleague.org)]

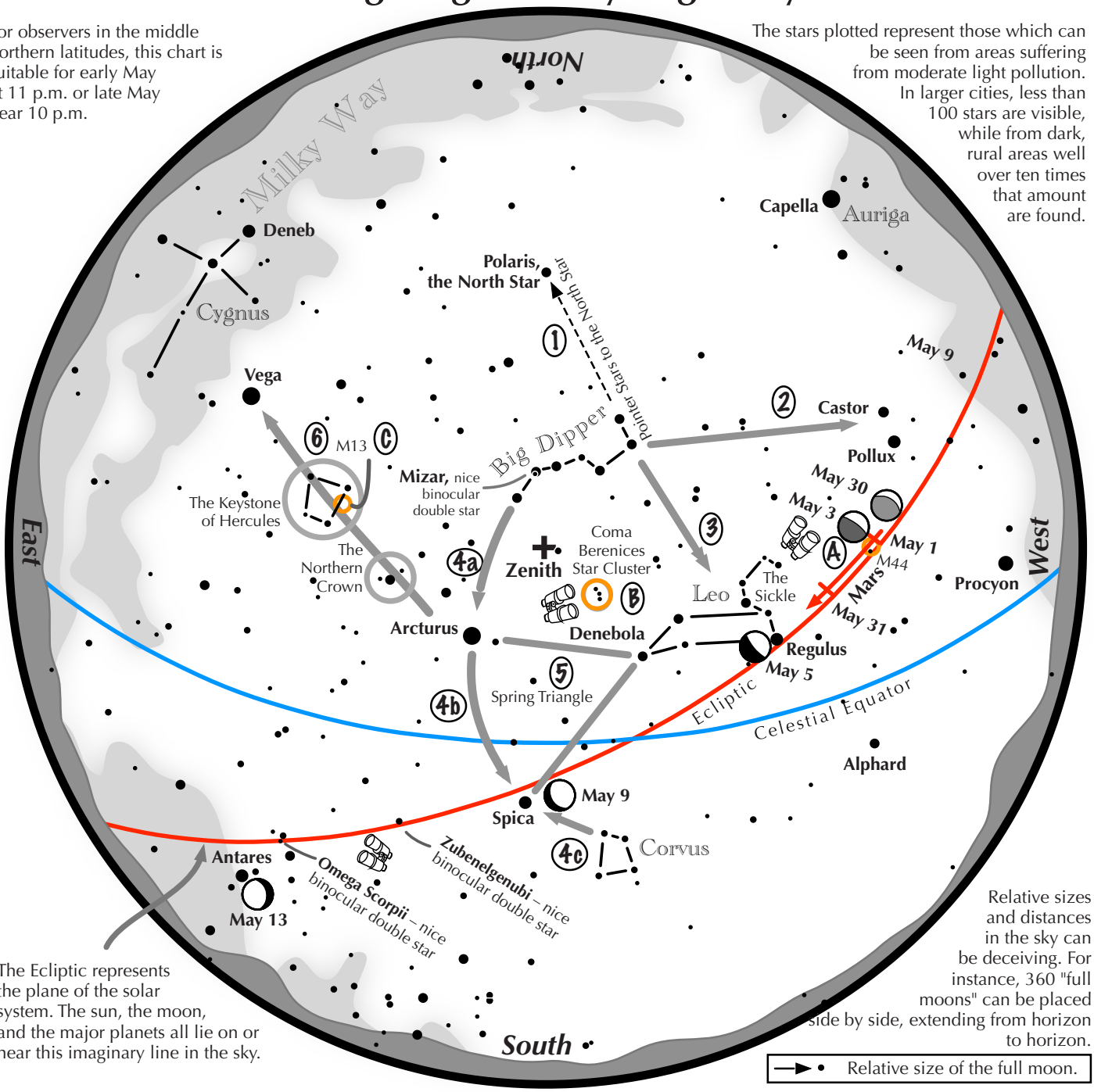
The utility of this resource over others is that it ties the monthly targets available for observing back to specific AL Observing programs so that you can plan effectively what targets to tackle each month to advance within a particular program.



Navigating the May Night Sky

For observers in the middle northern latitudes, this chart is suitable for early May at 11 p.m. or late May near 10 p.m.

The stars plotted represent those which can be seen from areas suffering from moderate light pollution. In larger cities, less than 100 stars are visible, while from dark, rural areas well over ten times that amount are found.



The Ecliptic represents the plane of the solar system. The sun, the moon, and the major planets all lie on or near this imaginary line in the sky.

Relative sizes and distances in the sky can be deceiving. For instance, 360 "full moons" can be placed side by side, extending from horizon to horizon.

→• Relative size of the full moon.

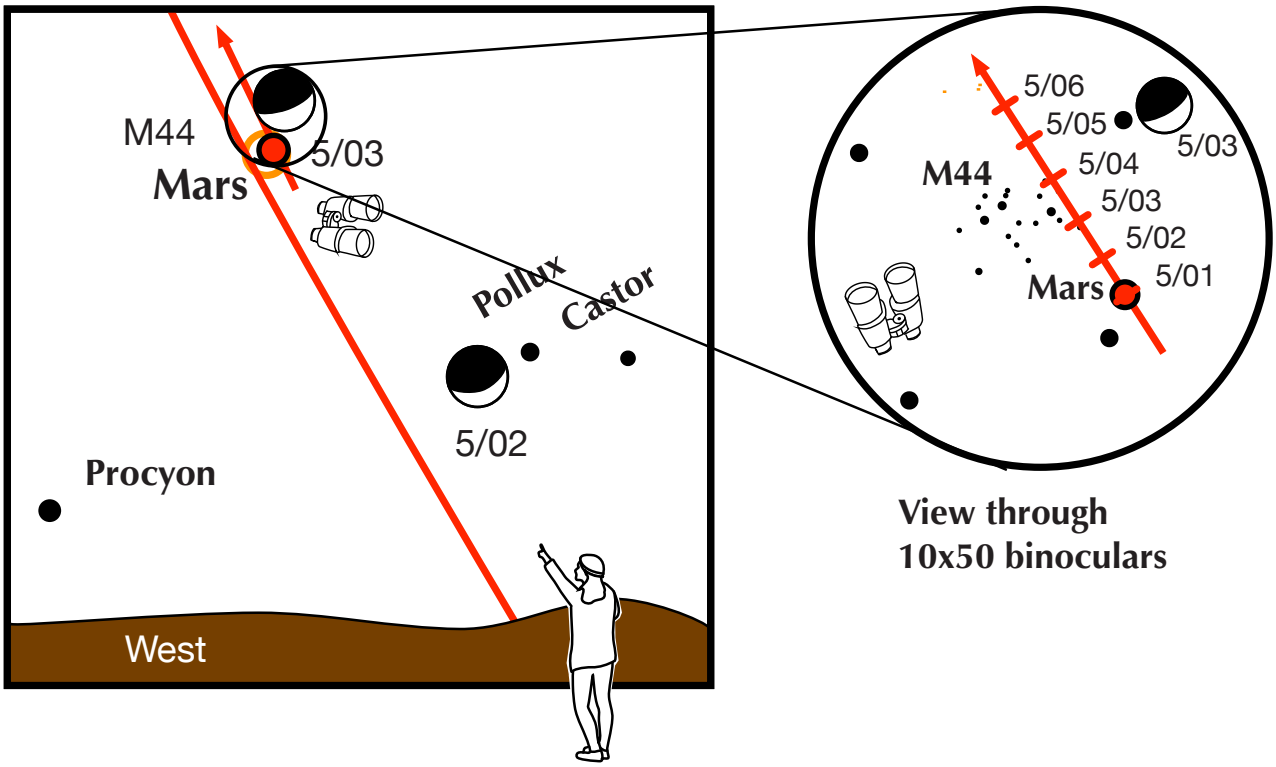
Navigating the May night sky: Simply start with what you know or with what you can easily find.

1. Extend a line northward from the two stars at the tip of the Big Dipper's bowl. It passes by Polaris, the North Star.
2. Through the two diagonal stars of the Dipper's bowl, draw a line pointing to the twin stars of Castor and Pollux in Gemini.
3. Directly below the Dipper's bowl reclines the constellation Leo with its primary star, Regulus.
4. Follow the arc of the Dipper's handle. It first intersects Arcturus, then continues to Spica. Confirm Spica by noting that two moderately bright stars just to its southwest form a straight line with it.
5. Arcturus, Spica, and Denebola form the Spring Triangle, a large equilateral triangle.
6. Draw a line from Arcturus to Vega. One-third of the way sits "The Northern Crown." Two-thirds of the way hides the "Keystone of Hercules." A dark sky is needed to see these two dim stellar configurations.

Binocular Highlights

A: M44, a star cluster barely visible to the naked eye, lies to the southeast of Pollux. **B:** Look near the zenith for the loose star cluster of Coma Berenices. **C:** M13, a round glow from a cluster of over 500,000 stars.

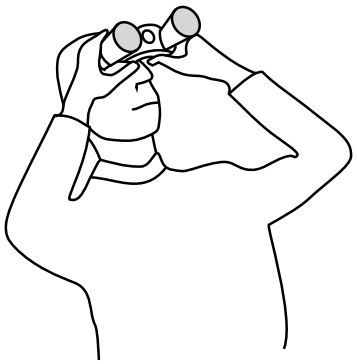
If you can see only one celestial event this month, see this one.



Beginning on May 1, look to the west-northwest 90 minutes after sunset.

• The twin stars of Gemini, Castor and Pollux, will be found forming a horizontal bar low above the horizon.

• On the following evening, the crescent moon moves near Pollux, almost forming a straight line with it and Castor.



• Red Mars slides toward M44, aka the Beehive Star cluster. Use binoculars to find Mars inching closer to the many stellar bees.

• On May 3, the thick crescent moon joins Mars sitting to the upper left of the red planet and above the bees.

• Over the next few evenings, the Red Planet moves past M44, leaving it on May 5.

Mare Orientale

... this most astounding impact basin is only partially seen

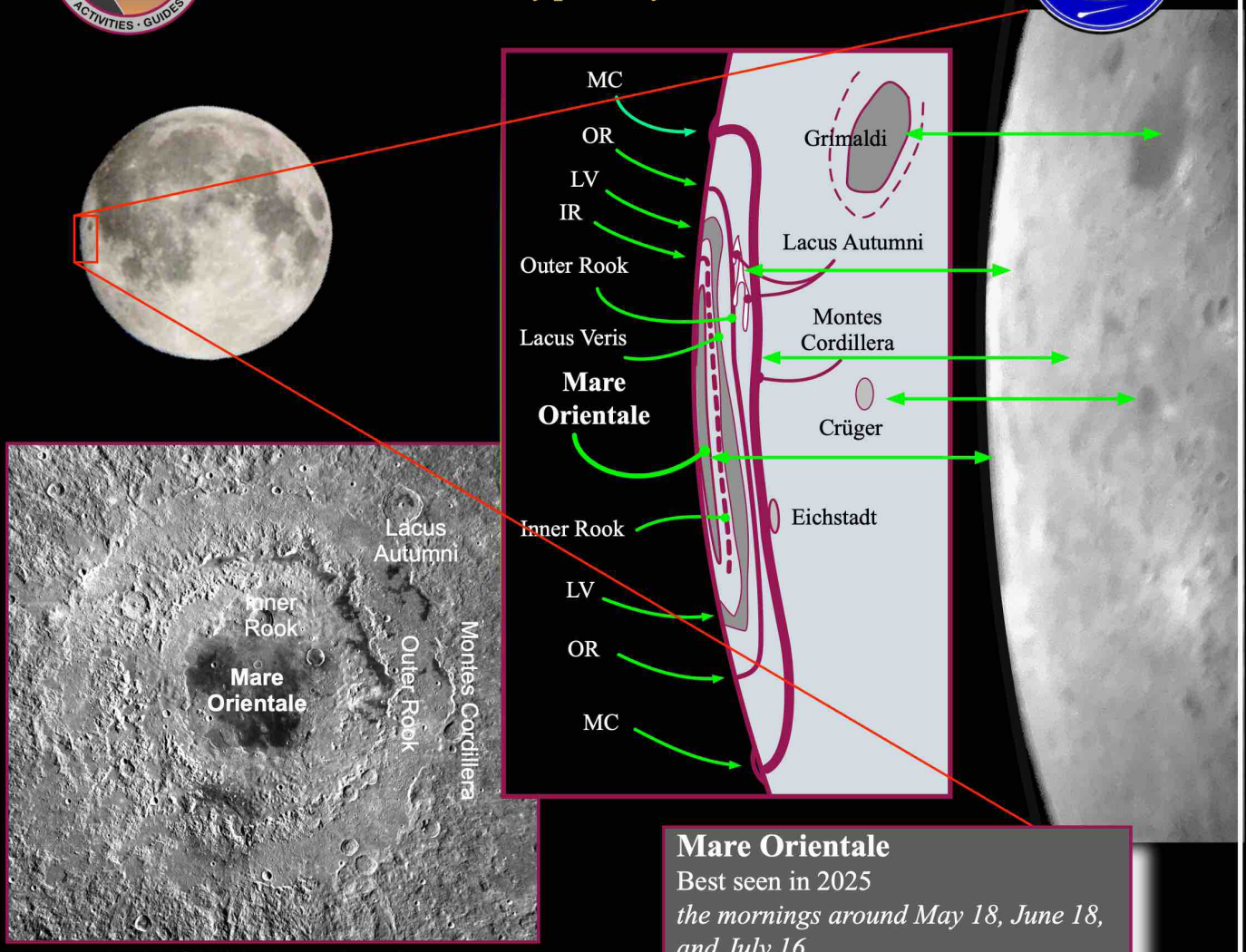


image: NASA/GSFC/ Arizona State University

Mare Orientale
Best seen in 2025
the mornings around May 18, June 18, and July 16

A good viewing of Mare Orientale requires that the Moon be at or near maximum western libration. This happens on three, four, or five days in some, but not all months. Of course, it should not hide in the lunar night, which immediately eliminates fifteen days each month. The three mornings leading up to new Moon are also poor times because the waning thin crescent lies too close to the horizon to give a sharp enough image for a clear, meaningful view.

As a result, opportunities for studying Mare Orientale are infrequent, occurring on fewer than twenty days each year. Generally, four months running present three, four, or five good opportunities each, followed by a string of nine or ten months that present no suitable occasions for viewing it. And then there is the weather!

Identifying Orientale's fascinating features demands steady seeing and moderate magnification.

2504

Hubble's 35th Anniversary

Full article here: https://science.nasa.gov/missions/hubble/nasa-celebrates-hubbles-35th-year-in-orbit/

Legendary space telescope redefined the universe.
In celebration of the Hubble Space Telescope's 35 years in Earth orbit, NASA is releasing today an assortment of compelling images recently take by Hubble, stretching from the planet Mars to spectacular star forming regions, to a magnificent neighboring galaxy. After over three decades of perusing the restless universe, Hubble remains a household word as the most well-recognized telescope in scientific history. The Hubble mission is a glowing success story of America's technological prowess and unyielding scientific curiosity, and a reiteration of our nation's pioneering spirit.

Perched above Earth's blurry atmosphere, Hubble's crystal-clear views have been nothing less than transformative for the public's perception of the cosmos. Through its evocative imagery, Hubble has made astronomy relevant, engaging, and accessible for people of all ages. Among its long list of breakthroughs: Hubble's deep field images unveiled myriad galaxies dating back to the early universe. The telescope also allowed scientists to precisely measure the universe's expansion, find that supermassive black holes are common among galaxies, and make the first measurement of the atmospheres of extrasolar planets. Hubble also contributed to the discovery of dark energy, which is accelerating the expansion of universe, leading to the 2011 Nobel Prize in Physics.

Before 1990, powerful optical telescopes on Earth could see only halfway across the cosmos. Estimates for the age of the universe disagreed by a big margin. Supermassive black holes were only suspected to be the powerhouses behind a rare zoo of energetic phenomena. Not a single planet had been seen around another star.

Among its long list of breakthroughs: Hubble's deep field images unveiled myriad galaxies dating back to the early universe. The telescope also allowed scientists to precisely measure the universe's expansion, find that supermassive black holes are common among galaxies, and make the first measurement of the atmospheres of exoplanets. Hubble also contributed to the discovery of dark energy, the mysterious phenomenon accelerating the expansion of universe, leading to the 2011 Nobel Prize in Physics.

The relentless pace of Hubble's trailblazing discoveries kick-started a new generation of space telescopes for the 21st century. Hubble provided the first observational evidence that there were myriad distant galaxies for Webb to pursue in infrared wavelengths that reach even farther beyond Hubble's gaze. Now, Hubble and Webb are often being used in complement to study everything from exoplanets to galaxy evolution.

Hubble's planned successor, the Habitable Worlds Observatory, will have a significantly larger mirror than Hubble's to study the universe in visible and ultraviolet light. It will be significantly sharper than Hubble and up to 100 times more sensitive to starlight. The Habitable Worlds Observatory will advance science across all of astrophysics, as Hubble has done for over three decades. A major goal of the future mission is to identify terrestrial planets around neighboring stars that might be habitable.

The Hubble Space Telescope continues to make ground-breaking discoveries that shape our fundamental understanding of the universe. Hubble is a project of international cooperation between NASA and ESA (European Space Agency). NASA's Goddard Space Flight Center in Greenbelt, Maryland, manages the telescope and mission operations. Lockheed Martin Space, based in Denver, also supports mission operations at Goddard. The Space Telescope Science Institute in Baltimore, which is operated by the Association of Universities for Research in Astronomy, conducts Hubble science operations for NASA.

Dying Star Viewed By Webb

Only the James Webb Space Telescope has the ability to fully detail this planetary nebula's dusty rings with its unique mid-infrared camera.

Come one, come all to witness the "magic" of a dying star's dust sent across space!

The James Webb Space Telescope has taken the most detailed image of planetary nebula NGC 1514 to date thanks to its unique mid-infrared observations. Webb's image brings out the nebula's nuances, particularly its "fuzzy" dusty rings. Also look for holes in the central pink region where material has broken through.

Two central stars, which appear as one in Webb's image, formed this scene over thousands of years — and will keep at it for thousands more.

Gas and dust ejected by a dying star at the heart of NGC 1514 came into complete focus thanks to mid-infrared data from NASA's James Webb Space Telescope. Its rings, which are only detected in infrared light, now look like "fuzzy" clumps arranged in tangled patterns, and a network of clearer holes close to the central stars shows where faster material punched through.

"Before Webb, we weren't able to detect most of this material, let alone observe it so clearly," said Mike Ressler, a researcher and project scientist for Webb's MIRI (Mid-Infrared Instrument) at NASA's Jet Propulsion Laboratory in southern California. He discovered the rings around NGC 1514 in 2010 when he examined the image (at left) from NASA's Wide-field Infrared Survey Explorer (WISE). "With MIRI's data, we can now comprehensively examine the turbulent nature of this nebula," he said.

This scene has been forming for at least 4,000 years — and will continue to change over many more millennia. At the center are two stars that appear as one in Webb's observation, and are set off with brilliant diffraction spikes. The stars follow a tight, elongated nine-year orbit and are draped in an arc of dust represented in orange.

One of these stars, which used to be several times more massive than our Sun, took the lead role in producing this scene. "As it evolved, it puffed up, throwing off layers of gas and dust in in a very slow, dense stellar wind," said David Jones, a senior scientist at the Institute of Astrophysics on the Canary Islands, who proved there is a binary star system at the center in 2017.

Once the star's outer layers were expelled, only its hot, compact core remained. As a white dwarf star, its winds

both sped up and weakened, which might have swept up material into thin shells.

Its Hourglass Shape

Webb's observations show the nebula is tilted at a 60-degree angle, which makes it look like a can is being poured, but it's far more likely that NGC 1514 takes the shape of an hourglass with the ends lopped off. Look for hints of its pinched waist near top left and bottom right, where the dust is orange and drifts into shallow V-shapes.

What might explain these contours? "When this star was at its peak of losing material, the companion could have gotten very, very close," Jones said. "That interaction can lead to shapes that you wouldn't expect. Instead of producing a sphere, this interaction might have formed these rings."

Though the outline of NGC 1514 is clearest, the hourglass also has "sides" that are part of its three-dimensional shape. Look for the dim, semi-transparent orange clouds between its rings that give the nebula body.

A Network of Dappled Structures

The nebula's two rings are unevenly illuminated in Webb's observations, appearing more diffuse at bottom left and top right. They also look fuzzy, or textured. "We think the rings are primarily made up of very small dust grains," Ressler said. "When those grains are hit by ultraviolet light from the white dwarf star, they heat up ever so slightly, which we think makes them just warm enough to be detected by Webb in mid-infrared light."

In addition to dust, the telescope also revealed oxygen in its clumpy pink center, particularly at the edges of the bubbles or holes.

NGC 1514 is also notable for what is absent. Carbon and more complex versions of it, smoke-like material known as polycyclic aromatic hydrocarbons, are common in planetary nebulae (expanding shells of glowing gas expelled by stars late in their lives). Neither were detected in NGC 1514. More complex molecules might not have had time to form due to the orbit of the two central stars, which mixed up the ejected material. A simpler composition also means that the light from both stars reaches much farther, which is why we see the faint, cloud-like rings.

What about the bright blue star to the lower left with slightly smaller diffraction spikes than the central stars? It's not part of this nebula. In fact, this star lies closer to us.

This planetary nebula has been studied by astronomers since the late 1700s. Astronomer William Herschel noted in 1790 that NGC 1514 was the first deep sky object to appear genuinely cloudy — he could not resolve what he saw into individual stars within a cluster, like other objects he cataloged. With Webb, our view is considerably clearer.

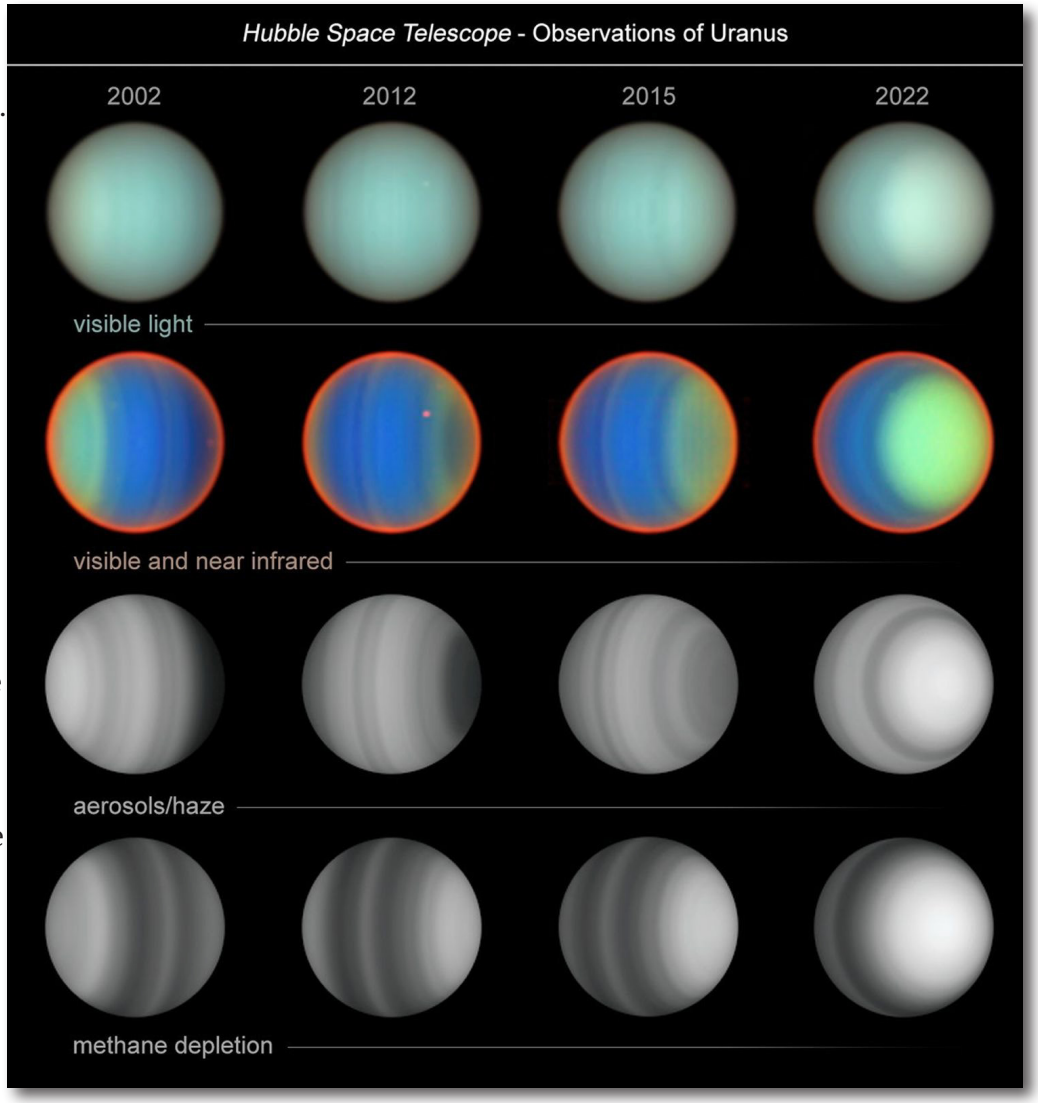
NGC 1514 lies in the Taurus constellation approximately 1,500 light-years from Earth.

The James Webb Space Telescope is the world's premier space science observatory. Webb will solve mysteries in our solar system, look beyond to distant worlds around other stars, and probe the mysterious structures and origins of our universe and our place in it. Webb is an international program led by NASA with its partners, ESA (European Space Agency) and the Canadian Space Agency.

To learn more about Webb, visit: https://science.nasa.gov/webb

Uranus findings can aid the study of exoplanets.

Halfway through its fourth decade, Hubble's long life has proven invaluable for studying the atmosphere of the mysterious ice giant Uranus. By repeatedly training Hubble on the distant cyan planet over the course of 20 years, researchers chronicled a two-decade story of seasonal changes. These astronomers have gained new understanding of the atmospheric dynamics of Uranus, which can serve as a proxy for studying exoplanets of similar size and composition.



The ice-giant planet Uranus, which travels around the Sun tipped on its side, is a weird and mysterious world. Now, in an unprecedented study spanning two decades, researchers using NASA's Hubble Space Telescope have uncovered new insights into the planet's atmospheric composition and dynamics. This was possible only because of Hubble's sharp resolution, spectral capabilities, and longevity.

The team's results will help astronomers to better understand how the atmosphere of Uranus works and responds to changing sunlight. These long-term observations provide valuable data for understanding the atmospheric dynamics of this distant ice giant, which can serve as a proxy for studying exoplanets of similar size and composition.

When Voyager 2 flew past Uranus in 1986, it provided a close-up snapshot of the sideways planet. What it saw resembled a bland, blue-green billiard ball. By comparison, Hubble chronicled a 20-year story of seasonal changes from 2002 to 2022. Over that period, a team led by Erich Karkoschka of the University of Arizona, and Larry Sromovsky and Pat Fry from the University of Wisconsin used the same Hubble instrument, STIS (the Space Telescope Imaging Spectrograph), to paint an accurate picture of the atmospheric structure of Uranus.

Uranus' atmosphere is mostly hydrogen and helium, with a small amount of methane and traces of water and ammonia. The methane gives Uranus its cyan color by absorbing the red wavelengths of sunlight.

The Hubble team observed Uranus four times in the 20-year period: in 2002, 2012, 2015, and 2022. They found that, unlike conditions on the gas giants Saturn and Jupiter, methane is not uniformly distributed across Uranus. Instead, it is strongly depleted near the poles. This depletion remained relatively constant over the two decades. However, the aerosol and haze structure changed dramatically, brightening significantly in the northern polar region as the planet approaches its northern summer solstice in 2030.

Uranus takes a little over 84 Earth years to complete a single orbit of the Sun. So, over two decades, the Hubble team has only seen mostly northern spring as the Sun moves from shining directly over Uranus' equator toward shining almost directly over its north pole in 2030. Hubble observations suggest complex atmospheric circulation patterns on Uranus during this period. The data that are most sensitive to the methane distribution indicate a downwelling in the polar regions and upwelling in other regions.

The team analyzed their results in several ways. The image columns show the change of Uranus for the four years that STIS observed Uranus across a 20-year period. Over that span of time, the researchers watched the seasons of Uranus as the south polar region (left) darkened going into winter shadow while the north polar region (right) brightened as it began to come into a more direct view as northern summer approaches.

The top row, in visible light, shows how the color of Uranus appears to the human eye as seen through even an amateur telescope.

In the second row, the false-color image of the planet is assembled from visible and near-infrared light observations. The color and brightness correspond to the amounts of methane and aerosols. Both of these quantities could not be distinguished before Hubble's STIS was first aimed at Uranus in 2002. Generally, green areas indicate less methane than blue areas, and red areas show no methane. The red areas are at the limb, where the stratosphere of Uranus is almost completely devoid of methane.

The two bottom rows show the latitude structure of aerosols and methane inferred from 1,000 different wavelengths (colors) from visible to near infrared. In the third row, bright areas indicate cloudier conditions, while the dark areas represent clearer conditions. In the fourth row, bright areas indicate depleted methane, while dark areas show the full amount of methane.

At middle and low latitudes, aerosols and methane depletion have their own latitudinal structure that mostly did not change much over the two decades of observation. However, in the polar regions, aerosols and methane depletion behave very differently.

In the third row, the aerosols near the north pole display a dramatic increase, showing up as very dark during early northern spring, turning very bright in recent years. Aerosols also seem to disappear at the left limb as the solar radiation disappeared. This is evidence that solar radiation changes the aerosol haze in the atmosphere of Uranus. On the other hand, methane depletion seems to stay quite high in both polar regions throughout the observing period.

Astronomers will continue to observe Uranus as the planet approaches northern summer.

The Hubble Space Telescope has been operating for over three decades and continues to make ground-breaking discoveries that shape our fundamental understanding of the universe. Hubble is a project of international cooperation between NASA and ESA (European Space Agency). NASA's Goddard Space Flight Center in Greenbelt, Maryland, manages the telescope and mission operations. Lockheed Martin Space, based in Denver, also supports mission operations at Goddard. The Space Telescope Science Institute in Baltimore, which is operated by the Association of Universities for Research in Astronomy, conducts Hubble science operations for NASA.

Webb's Imaging Is Amazing!

Webb's exquisite details reveal a chance, random alignment of a protostellar outflow and a distant spiral galaxy.

When peering out into space, we get a 2D view of a 3D universe. Sometimes, images will capture objects that appear close to each other on the sky, but are actually at wildly different distances and are unassociated with each other.

NASA's James Webb Space Telescope captured this beautiful juxtaposition of the nearby protostellar outflow known as Herbig-Haro 49/50 with a perfectly positioned, more distant spiral galaxy. Due to the close proximity of this Herbig-Haro object to the Earth, this new composite infrared image of the outflow from a young star allows researchers to examine details on small spatial scales like never before. With Webb, we can better understand how the jet activity associated with the formation of young stars can affect their surrounding environment.

Craving an ice cream sundae with a cherry on top? This random alignment of Herbig-Haro 49/50 — a frothy-looking outflow from a nearby protostar — with a multi-hued spiral galaxy may do the trick. This new composite image combining observations from NASA's James Webb Space Telescope's NIRCam (Near-Infrared Camera) and MIRI (Mid-Infrared Instrument) provides a high-resolution view to explore the exquisite details of this bubbling activity.

Herbig-Haro objects are outflows produced by jets launched from a nearby, forming star. The outflows, which can extend for light-years, plow into a denser region of material. This creates shock waves, heating the material to higher temperatures. The material then cools by emitting light at visible and infrared wavelengths.

When NASA's retired Spitzer Space Telescope observed it in 2006, scientists nicknamed Herbig-Haro 49/50 (HH 49/50) the "Cosmic Tornado" for its helical appearance, but they were uncertain about the nature of the fuzzy object at the tip of the "tornado." With its higher imaging resolution, Webb provides a different visual impression of HH 49/50 by revealing fine features of the shocked regions in the outflow, uncovering the fuzzy object to be a distant spiral galaxy, and displaying a sea of distant background galaxies.

HH 49/50 is located in the Chamaeleon I Cloud complex, one of the nearest active star formation regions in our Milky Way, which is creating numerous low-mass stars similar to our Sun. This cloud complex is likely similar to the environment that our Sun formed in. Past observations of this region show that the HH 49/50 outflow is moving away from us at speeds of 60-190 miles per second (100-300 kilometers per second) and is just one

feature of a larger outflow.

Webb's NIRCam and MIRI observations of HH 49/50 trace the location of glowing hydrogen molecules, carbon monoxide molecules, and energized grains of dust, represented in orange and red, as the protostellar jet slams into the region. Webb's observations probe details on small spatial scales that will help astronomers to model the properties of the jet and understand how it is affecting the surrounding material.

The arc-shaped features in HH 49/50, similar to a water wake created by a speeding boat, point back to the source of this outflow. Based on past observations, scientists suspect that a protostar known as Cederblad 110 IRS4 is a plausible driver of the jet activity. Located roughly 1.5 light-years away from HH 49/50 (off the lower right corner of the Webb image), CED 110 IRS4 is a Class I protostar. Class I protostars are young objects (tens of thousands to a million years old) in the prime time of gaining mass. They usually have a discernable disk of material surrounding it that is still falling onto the protostar. Scientists recently used Webb's NIRCam and MIRI observations to study this protostar and obtain an inventory of the icy composition of its environment.

These detailed Webb images of the arcs in HH 49/50 can more precisely pinpoint the direction to the jet source, but not every arc points back in the same direction. For example, there is an unusual outcrop feature (at the top right of the main outflow) which could be another chance superposition of a different outflow, related to the slow precession of the intermittent jet source. Alternatively, this feature could be a result of the main outflow breaking apart.

The galaxy that appears by happenstance at the tip of HH 49/50 is a much more distant, face-on spiral galaxy. It has a prominent central bulge represented in blue that shows the location of older stars. The bulge also shows hints of "side lobes" suggesting that this could be a barred-spiral galaxy. Reddish clumps within the spiral arms show the locations of warm dust and groups of forming stars. The galaxy even displays evacuated bubbles in these dusty regions, similar to nearby galaxies observed by Webb as part of the PHANGS program.

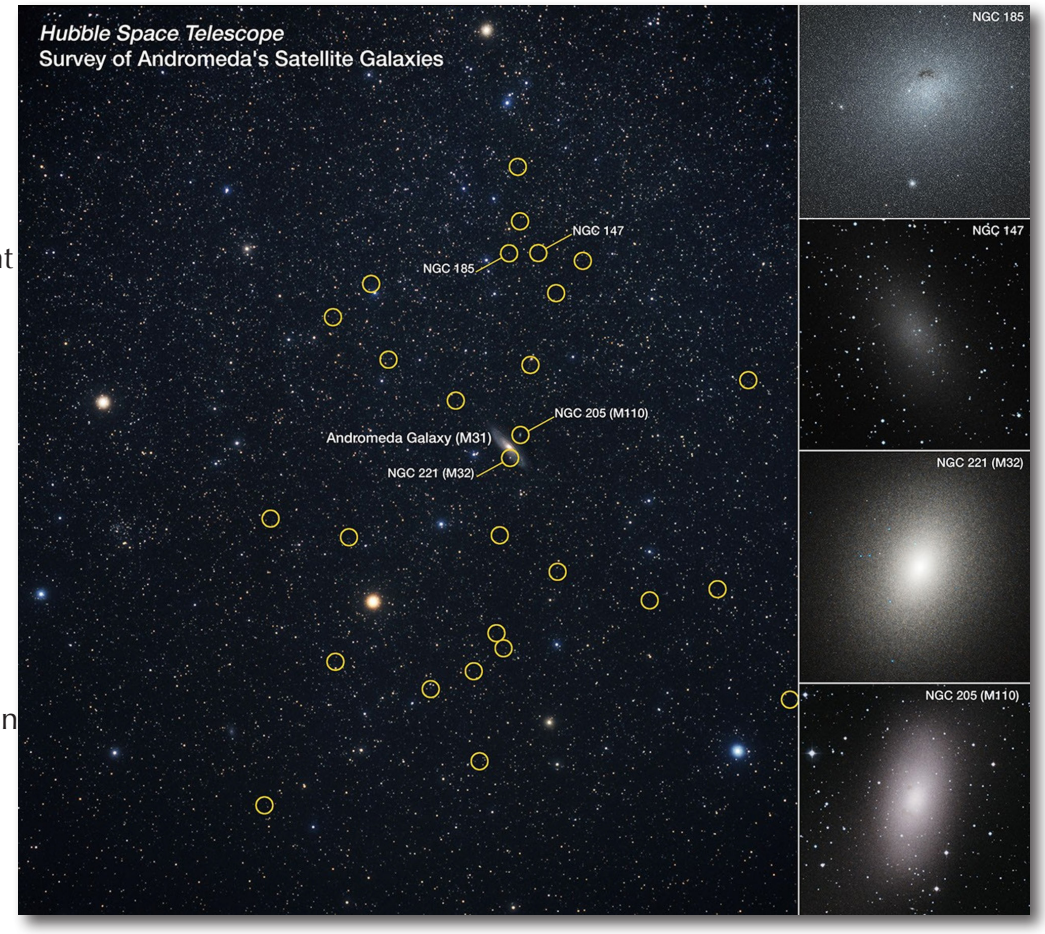
Webb has captured these two unassociated objects in a lucky alignment. Over thousands of years, the edge of HH 49/50 will move outwards and eventually appear to cover up the distant galaxy.

Want more? Take a closer look at the image, "fly through" it in a visualization, and compare Webb's image to the Spitzer Space Telescope's.

Herbig-Haro 49/50 is located about 625 light-years from Earth in the constellation Chamaeleon.

The James Webb Space Telescope is the world's premier space science observatory. Webb is solving mysteries in our solar system, looking beyond to distant worlds around other stars, and probing the mysterious structures and origins of our universe and our place in it. Webb is an international program led by NASA with its partners, ESA (European Space Agency) and the Canadian Space Agency.

A Swarm of Dwarf Galaxies Buzz Around Our Milky Way's Twin



You can think of our Milky Way galaxy and the neighboring Andromeda galaxy as two giant aircraft carriers accompanied by a flotilla of smaller warships. Those ships in this imaginary battle fleet are dwarf galaxies, a fraction the size and mass of the giant spiral galaxies. Our Milky Way has about 70 known dwarf galaxies, and Andromeda appears to have three times as many. The dwarf galaxies provide clues as to how the Milky Way and Andromeda evolved over billions of years. The satellites tell a markedly different story for each system. Our Milky Way has led a relatively placid life, while it's been a game of bumper cars around Andromeda—including a major collision several billion years ago. In an ambitious observing program, the Hubble Space Telescope was used to inventory all of the known dwarf galaxies surrounding Andromeda.

Located 2.5 million light-years away, the majestic Andromeda galaxy appears to the naked eye as a faint, spindle-shaped object roughly the angular size of the full Moon. What backyard observers don't see is a swarm of nearly three dozen small satellite galaxies circling the Andromeda galaxy, like bees around a hive.

These satellite galaxies represent a rambunctious galactic "ecosystem" that NASA's Hubble Space Telescope is studying in unprecedented detail. This ambitious Hubble Treasury Program used observations from more than a whopping 1,000 Hubble orbits. Hubble's optical stability, clarity, and efficiency made this ambitious survey possible. This work included building a precise 3D mapping of all the dwarf galaxies buzzing around Andromeda and reconstructing how efficiently they formed new stars over the nearly 14 billion years of the universe's lifetime.

In the study published in The Astrophysical Journal, Hubble reveals a markedly different ecosystem from the smaller number of satellite galaxies that circle our Milky Way. This offers forensic clues as to how our Milky Way galaxy and Andromeda have evolved differently over billions of years. Our Milky Way has been relatively placid. But it looks like Andromeda has had a more dynamic history, which was probably affected by a major merger with another big galaxy a few billion years ago. This encounter, and the fact that Andromeda is as much as twice as massive as our Milky Way, could explain its plentiful and diverse dwarf galaxy population.

Surveying the Milky Way's entire satellite system in such a comprehensive way is very challenging because we are embedded inside our galaxy. Nor can it be accomplished for other large galaxies because they are too far away to study the small satellite galaxies in much detail. The nearest galaxy of comparable mass to the Milky Way beyond Andromeda is M81, at nearly 12 million light-years.

This bird's-eye view of Andromeda's satellite system allows us to decipher what drives the evolution of these small galaxies. "We see that the duration for which the satellites can continue forming new stars really depends on how massive they are and on how close they are to the Andromeda galaxy," said lead author Alessandro Savino of the University of California at Berkeley. "It is a clear indication of how small-galaxy growth is disturbed by the influence of a massive galaxy like Andromeda."

"Everything scattered in the Andromeda system is very asymmetric and perturbed. It does appear that something significant happened not too long ago," said principal investigator Daniel Weisz of the University of California at Berkeley. "There's always a tendency to use what we understand in our own galaxy to extrapolate more generally to the other galaxies in the universe. There's always been concerns about whether what we are learning in the Milky Way applies more broadly to other galaxies. Or is there more diversity among external galaxies? Do they have similar properties? Our work has shown that low-mass galaxies in other ecosystems have followed different evolutionary paths than what we know from the Milky Way satellite galaxies."

For example, half of the Andromeda satellite galaxies all seem to be confined to a plane, all orbiting in the same direction. "That's weird. It was actually a total surprise to find the satellites in that configuration and we still don't fully understand why they appear that way," said Weisz.

The brightest companion galaxy to Andromeda is Messier 32 (M32). This is a compact ellipsoidal galaxy that might just be the remnant core of a larger galaxy that collided with Andromeda a few billion years ago. After being gravitationally stripped of gas and some stars, it continued along its orbit. Galaxy M32 contains older stars, but there is evidence it had a flurry of star formation a few billion years ago. In addition to M32, there seems to be a unique population of dwarf galaxies in Andromeda not seen in the Milky Way. They formed most of their stars very early on, but then they didn't stop. They kept forming stars out of a reservoir of gas at a very low rate for a much longer time.

"Star formation really continued to much later times, which is not at all what you would expect for these dwarf galaxies," continued Savino. "This doesn't appear in computer simulations. No one knows what to make of that so far."

"We do find that there is a lot of diversity that needs to be explained in the Andromeda satellite system," added Weisz. "The way things come together matters a lot in understanding this galaxy's history."

Hubble is providing the first set of imaging where astronomers measure the motions of the dwarf galaxies. In another five years Hubble or NASA's James Webb Space Telescope will be able to get the second set of observations, allowing astronomers to do a dynamical reconstruction for all 36 of the dwarf galaxies, which will help astronomers to rewind the motions of the entire Andromeda ecosystem billions of years into the past.

The Hubble Space Telescope has been operating for over three decades and continues to make ground-breaking discoveries that shape our fundamental understanding of the universe. Hubble is a project of international cooperation between NASA and ESA (European Space Agency). NASA's Goddard Space Flight Center in Greenbelt, Maryland, manages the telescope and mission operations. Lockheed Martin Space, based in Denver, also supports mission operations at Goddard. The Space Telescope Science Institute in Baltimore, which is operated by the Association of Universities for Research in Astronomy, conducts Hubble science operations for NASA.

Click here for the full article and for larger images.

What's Going On in the SIG Group?

For the newbies or the vets, if you truly want to learn & share astrophotography, get involved in the SIG group. Join the email list, come to the meetings and ask a bunch of questions!

Our next Astro SIG meeting is Tuesday May 20th at 7pm, I hope you can join us.

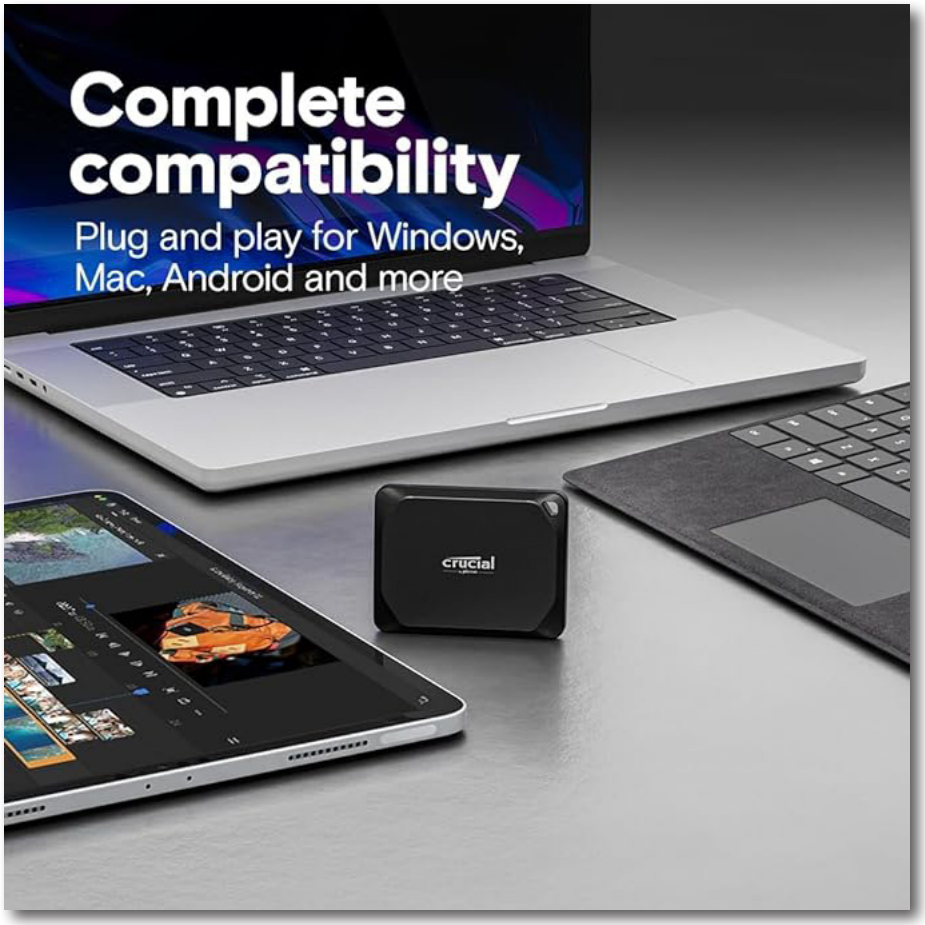
Here's the link for the Zoom call. Occasionaly this link may change so check the monthly newsletter for the most accurate link.

https://zoom.us/j/95463483537?pwd=6EprbaLEuVacLvRgBTVxehkTGh1WSP.1

Meeting ID: 954 6348 3537
Passcode: 052283

HARD DRIVES!

Just a reminder to all my fellow astrophotographers. At the end of each processing session I (almost) always try to go back and remove/delete my Calibrated and Registered folders. Also the Subframe Export folder/s. With the huge amount of storage our astro hobby takes, removing these folders can really save you some hard drive space. Also, speaking of hard drive space, I use the Crucial x10 Pro 4TB Portable SSD. I have loads of them on my desk for use with all of my photo projects and for backing up. I get no kickback but I like to pass along what works for me. I NEVER store any photo files on my internal hard drives. Those are for OS files only.



Also, for those of you who travel. I usually take 2-3 of these on the road with me. They take up virtually no space and store a LOT. I usually download (two two drives) every day.

Enjoy!

M94 The Croc's Eye Galaxy by Dick Cogswell
Brand/Type of Telescope/Lens: C-14 Edge at 2750mm f/l
Mount: AP 1100AE
Exposures: 79 4-minute exposures in LRGBHa

Processing Software: APP, BX, PS
Here's the story: Messier 94 (also known as the Croc's Eye Galaxy) is a spiral galaxy in the mid-northern constellation Canes Venatici between 15 and 17 million light years away. Although some references describe M94 as a barred spiral galaxy, the "bar" structure appears to be more oval-shaped. The galaxy has two ring structures. The inner ring with a diameter of about 5,400 light-years and an outer ring with a diameter of about 45,000 light-years. These rings appear to form at resonance points in the disk of the galaxy. The inner ring is the site of strong star formation activity and is sometimes referred to as a starburst ring. This star formation is fueled by gas driven dynamically into the ring by the inner oval-shaped bar-like structure.

M94 is one of the brightest galaxies within the M94 Group, a group of galaxies that contains between 16 and 24 galaxies. This group is one of many that lie within the Virgo Supercluster (i.e. the Local Supercluster). At least 5 of these companion galaxies can be seen in the background.

NGC 4762 The Paper Kite Galaxy by Dick Cogswell

Brand/Type of Telescope/Lens: Planewave CDK14
Mount: AP 1100AE
Exposures: 54 5-minute exposures in OSC
Processing Software: APP, BX, PS
Here's the story: NGC 4762 is an edge-on lenticular galaxy in the constellation Virgo. It is at a distance of 60 million light years and is a member of the Virgo Cluster. The edge-on view of this particular galaxy, originally considered to be a barred spiral galaxy, makes it difficult to determine its true shape, but it is considered that the galaxy consists of four main components — a central bulge, a bar, a thick disc and an outer ring.

NGC 4762 forms a non-interacting pair with the galaxy NGC 4754, the upper large galaxy in this image. Both these galaxies show some signs of interaction, particularly NGC 4762, which shows tidal distortions at both ends of the galaxy in deep images. The problems come in that the distance measurements to each galaxy would suggest they are not close together in space, however the distance measurements by differing methods are wildly discordant. (They are both believed to be members of the Virgo cluster.) NGC 4762 contains an active galactic nucleus, a highly energetic central region, and its disc is asymmetric and warped, which could be explained by a collision with another galaxy in the past. The remains of this former companion may then have merged right into 4762, redistributing the gas and stars and so changing the disc's morphology.

NGC 2835 by Dick Cogswell

Brand/Type of Telescope/Lens: Planewave CDK14
Mount: AP 1100AE
Exposures: 73 5-minute exposures in OSC with 2600MC Duo

Processing Software: APP, PI and PS
Here's the story: NGC 2835 is an intermediate spiral galaxy located in the constellation Hydra. It is located at a distance of circa 35 million light years from Earth, which, given its apparent dimensions, means that NGC 2835 is about 65,000 light years across, about 1/3 the size of M101, and is located only 18.5 degrees from the galactic plane.

It was discovered on April 13, 1884 by Wilhelm Tempel, a German astronomer who worked in Marseille until the outbreak of the Franco-Prussian War in 1870, and then moved to Italy.

NGC 2835 is seen nearly face-on. The galaxy features four or five spiral arms, visible in near infrared due to their population II stars. The spiral arms have also numerous HII regions and stellar associations, the larger of which are 5 arc seconds across. Although the galaxy is quite symmetric, the northern arms have HII regions that appear brighter than the southern ones. Also the southern arms appear less developed in their outer parts than the north ones. In the center of NGC 2835 lies a supermassive black hole whose mass is estimated to be 3-10 million solar masses based on the spiral arm pitch angle.

NGC 2835 is the foremost galaxy in a small group of galaxies, the NGC 2835 group. A bit farther away, at projected separation of 2.2 degrees, lies NGC 2784 and its small galaxy group.

NGC 2217 by Dick Cogswell

Brand/Type of Telescope/Lens: C-14 Edge at 2750mm f/l
Mount: AP 1100AE
Exposures: 174 4-minute exposures in LRGBHa

Processing Software: APP, BX, PS
Here's the story: NGC 2217 is a barred spiral galaxy about 100 thousand light-years across that lies roughly 65 million light years from Earth in the constellation of Canis Major. It is part of the NGC 2217 Group of galaxies.

A notable feature is the swirling shape of this galaxy. In its very concentrated central region we can see a distinctive, very luminous bar of stars within an oval ring. Further out, a set of tightly wound spiral arms almost form a circular ring around the galaxy. Nothing is known about this galaxy, so I'll have to make it up. So I'll say it was discovered by Hugo Moravia, a jeweler in Antwerp, who deemed it a ring galaxy, by the shape, not the sound, because he made many rings, some familiar. The ring is distorted, suggesting it had an argument, or at least a heated discussion, with another galaxy sometime in the past.

ARP 244 The Antennae Galaxies by Dick Cogswell
Brand/Type of Telescope/Lens: Planewave CDK14
Mount: AP 1100AE
Exposures: 85 5-minute exposures in OSC

Processing Software: APP, BX, PS
Here's the story: The Antennae Galaxies (NGC 4038/NGC 4039) are a pair of interacting galaxies in the constellation Corvus. They are currently going through a starburst phase, in which the collision of clouds of gas and dust, with entangled magnetic fields, causes rapid star formation. The Antennae Galaxies are undergoing a galactic collision. A 2008 study found that they are less remote from the Milky Way than previously thought—at 45 million light-years instead of 65 million light-years.

About 1.2 billion years ago, the Antennae were two separate galaxies. NGC 4038 was a barred spiral galaxy and NGC 4039 was a spiral galaxy. 900 million years ago, the Antennae began to approach one another, and 600 million years ago, the Antennae passed through each other, looking like the Mice Galaxies. 300 million years ago, the Antennae's stars began to be released from both galaxies. Today the two streamers of ejected stars extend far beyond the original galaxies, resulting in the antennae shape.

Within 400 million years, the Antennae's nuclei will collide and become a single core with stars, gas, and dust around it. Observations and simulations of colliding galaxies suggest that the Antennae Galaxies will eventually form one giant elliptical galaxy.

M104 The Sombrero Galaxy by Dick Cogswell

Brand/Type of Telescope/Lens: Planewave CDK14
Mount: AP 1100AE
Exposures: 74 5-minute exposures in OSC

Processing Software: APP, BX, PS
Here's the story: The Sombrero Galaxy (also known as M104) is a peculiar galaxy of unclear classification in the constellation borders of Virgo and Corvus, being about 31.1 million light-years from the Milky Way. It is a member of the Virgo II Groups, a series of galaxies and galaxy clusters strung out from the southern edge of the Virgo Supercluster. It has a diamter of 94,900 to 105,000 light-years, making it slightly bigger in size than the Milky Way.

It has a bright nucleus, an unusually large central bulge, and a prominent dust lane in its outer disk, which from Earth is viewed almost edge-on. Astronomers initially thought the halo was small and light, indicative of a spiral galaxy; but the Spitzer Space Telescope found that the halo was significantly larger and more massive than previously thought, indicative of a giant elliptical galaxy.

M104 has a large number of globular clusters, estimated at 1,200 to 2,000, ten times the number in the Milky Way.

NGC 3344 The Sliced Onion Galaxy by Dick Cogswell
Brand/Type of Telescope/Lens: Planewave CDK14
Mount: AP 1100AE
Exposures: 41 5-minute exposures in OSC

Processing Software: APP, BX, PS
Here's the story: NGC 3344 is a relatively isolated barred spiral galaxy around half the size of the Milky Way located 22.5 million light years away in the constellation Leo Minor. This galaxy belongs to the group known as the Leo spur, which is a branch of the Virgo Supercluster.

NGC 3344 has the morphological classification (R)SAB(r)bc, which indicates it is a weakly barred spiral galaxy that exhibits rings, moderate to loosely wound spiral arms and an unpleasant odor. There is both an inner and outer ring, with the prominent arms radiating outward from the inner ring and the slightly elliptical bar being situated inside. At the center of the bar is an HII nucleus with an angular diameter of about 3. In 2012 NGC 3344 hosted a supernova.

M101 - The Pinwheel Galaxy by Mike Jensen
Brand/Type of Telescope/Lens: Explore Scientific 127
Mount: EQ6R PRO
Exposures: 71 x 300secs of Red, Green and Blue, 62 x 300secs of Lum, and 59 x 300secs of Ha. A total of 28 hours of integration time.

Processing Software: PixInsight & Photoshop

Here's the story: This galaxy took some effort over 6-7 nights as I had some issues with cable drag and some possible Diffirential Flexure, ugh. So, as we all do, I slogged through, asked questions of my fellow astrophotographers and kept going. Finally got enough data to call it done. I also processed this image following a YouTube by SetiAstro. A great refresher for LRGBHA processing.

M3 - The Great Globular Cluster by Mike Jensen
Brand/Type of Telescope/Lens: Explore Scientific 127
Mount: EQ6R PRO
Exposures: 83 Frames Red, 91 Frames Green, 106 Frames Blue, 60 Frames of Luminosity. All 60 seconds.

Processing Software: PixInsight

Here's the story: I began shooting this as a test target while working through some flexure issues with my rig. I'd never shot M3 before and I'm REALLY happy with the results. I also processed this image following a YouTube by SetiAstro. A great refresher for LRGBHA processing.

M3 is a globular cluster of stars in the northern constellation of Canes Venatici. A globular cluster is a spheroidal conglomeration of stars that is bound together by gravity, with a higher concentration of stars towards its center. It can contain anywhere from tens of thousands to many millions of member stars, all orbiting in a stable, compact formation. M3 has 500,000 stars!
It was discovered on May 3, 1764, and was the first Messier object to be discovered by Charles Messier himself. Messier originally mistook the object for a nebula without stars. This mistake was corrected after the stars were resolved by William Herschel around 1784. Since then, it has become one of the best-studied globular clusters. Identification of the cluster's unusually large variable star population was begun in 1913 by American astronomer Solon Irving Bailey and new variable members continue to be identified up through 2004.

Messier 106 and NGC4217 by Scott Cruzen

Brand/Type of Telescope/Lens: IOptron 204mm F8 Ritchie-Chretien 1628mm FL
Mount: Skywatcher EQ6-R Pro, ASIAir Plus
Exposures:
ASI2600MM Pro with Optolong and ZWO RGB Filters
177 x 240sec R
171 x 240sec G
165 x 240sec B
34 hours total

Processing Software: SiriL/SiriLic, GIMP, DarkTable, Topaz

Here's the story: Messier 106 is an Intermediate Spiral Galaxy (sort of halfway between spiral and barred spiral) located about 25 million light years distant in the constellation Canes Venatici. M106 has a supermassive black hole at its core with an estimated mass of 4 x 10^7 solar masses. M106 has what appears to be an extra pair of spiral arms. These "Anomalous" arms are actually made up of hot ionized gases rather than stars. M106 is slightly warped due its interaction with nearby galaxies. The large edge-on barred spiral galaxy also seen in this image, NGC4217, is almost perfectly edge-on from our vantage and lies about 60 million light years from Earth. I was able to count over two dozen galaxies in the original full scale version of this image.

Messier 63 - The Sunflower Galaxy by Scott Cruzen

Brand/Type of Telescope/Lens: IOptron 204mm F8 Ritchie-Chretien 1628mm FL
Mount: Skywatcher EQ6-R Pro, ASIAir Plus
Exposures:
ASI2600MM Pro Camera with Optolong and ZWO RGB filters
157 x 240sec R
154 x 240sec G
140 x 240sec B
31 hours total

Processing Software: SiriL/SiriLic, GIMP, DarkTable, Topaz
Here's the story:

M63 is a flocculent (meaning "fluffy" or "tufted") spiral galaxy located about 30 million light years away in the constellation Canes Venatici. M63 belongs to the M51 group of galaxies, named for the Whirlpool Galaxy, Messier 51. Unlike grand design spiral galaxies, flocculent galaxies do not have well-defined spiral arms. M63 only has two spiral arms and they are not very distinct, instead appearing like discontinuous patches. M63 is estimated to be 110,000 light years in diameter but has a gaseous envelope that extends to 130,000 light years from the center, well beyond the visible rim of the disk.

Omega Centauri from Bonita Springs by Greg Pimento
Brand/Type of Telescope/Lens: ZWO FF80 600mm
Mount: ZWO AM5N
Exposures: 300 second subs x 21 exposures using Optolong's L-Pro filter and ZWO ASI533MC Pro camera

Processing Software: ASIair, Graxpert, Siril and Lightroom
Here's the story: Gorgeous globular cluster containing 10 million stars usually only visible from more southerly locations. Peak altitude from Bonita Springs is 16 degrees resulting in a large amount of atmospheric extinction and higher likelihood of cloud cover. Fortunate to have a short period of nearly two hours of clear skies from my location for this picture. Subsequent nights were all cloudy.

The Pinwheel Galaxy by JOHN UDART

Brand/Type of Telescope/Lens: Stellarvue SVX102T-Raptor, 102mm lens @ 714mm focal length
Mount: Sky-Watcher EQ6-R Pro
Exposures: 23 hours (278 @ 300s), OSC, Optolong L-Pro
10 hours (119 @ 300s) OSC, Optolong L-Xtreme (Ha, Oiii 7nm)

Processing Software: PixInsight
Here's the story: This is my first time imaging the Pinwheel Galaxy. It is a face-on, counterclockwise intermediate spiral galaxy located 21 million light-years from earth. I acquired the data over ten nights and, despite encountering multiple software issues and extreme moisture intrusion, it has become one of my favorite images to date.

Bode's Galaxy by JOHN UDART
Brand/Type of Telescope/Lens: Stellarvue SVX102T-Raptor, 102mm lens @ 714mm focal length
Mount: Sky-Watcher EQ6-R Pro
Exposures:15 hours (182 x 300 seconds), OSC, Optolong L-Pro filter

Processing Software: PixInsight
Here's the story: I have imaged this galaxy three times in the past four years. I really enjoy the way they compliment each other in both symmetry and color. Bode's Galaxy (M81) is a grand design spiral galaxy and the Cigar Galaxy (M82) is a starburst galaxy. Both galaxies are approximately 12 million light-years away.

Meeting Minutes

Southwest Florida Astronomical Society membership minutes for April 3, 2025 held at the Calusa Planetarium Nature Center

President Risley opened the meeting at 7:03 PM, welcomed everyone (14 on zoom, 19 in person, total of 33) and advised that our guest speaker was running a little late and that we would start the business meeting first until Steve Koenig is prepared.

President Risley advised that he had received the 2024 Annual Audit review letter from Sean Dey, read such to the membership, and stated that our Society's finances are sound and in order.
Vice President Jensen then asked that the budget and slate of offcers be presented in the October membership meeting, voted upon during the month of November and either approved or amended by the membership at the December meeting, thus avoiding delay into January. After much discussion, Brian then asked for a motion of approval of the 2024 annual audit and the amendment to our By Laws as stated, so moved by Mike Jensen and seconded by John MacLean, passed without objection.

Review of March Outreach events:
Charlotte County:
Tom Segur stated that the Monthly Solar observing event went well on March 8th at the Punta Gorda Ponce de Leon Park, and that all 3 parks are now open given repairs needed from prior Hurricane damage. Tom further stated that the March 28th FSW Moore Observatory event started later then February given EDST. A large crowd attended, but into the event, a security guard advised that the laser finders be eliminated due to proximity to the airport. Tom said that he had been holding this meeting for decades without incident nor objection. The Security guard did not care and advised that laser operations must be eliminated and that the crowd ought disperse by 10PM. Tom again stated that the timing is insuffcient given the crowd and the change of time. More to follow.

Lee County:
Brian Risley advised that both the Seahawk Park Star Party on March 22nd and the Big Cypress March 29th public observing were clouded out.

Program: President Risley interrupted the business meeting to announce that our guest speaker from Arizona was now prepared. Dan Dannenhauer introduced Seven Koenig, CEO, of Starizona Optics, a family owned firm formed in 1995 providing product innovative optical solutions for amateur and professional astronomers. The Topic of Why, When and how to use Them.

Steve Koenig spoke of his firm's history and professionalism regarding the HyperStar, SCT Corrector, Nexus, Night Owl and ApexEd. Formed in Tucson, Az, there now is a showroom of scopes and optics crafted to fit Celestron products, with the capacity to create as required optics for Meade, Orion and others given the volume needed. Steve illustrated the HyperStar imaging at the speed of light C6, C8, C9.25, C11 & C14, with pictographs of how the HyperStar attaches, no wedge, guiding or polar alignment required. He uploaded M42, IC417 and others as illustrations. Starizona has partnered with The University of Arizona's instrument researchers built to measure the brightness and position of SpaceX Starling satellites. He then illustrated the utilization of the SCT Corrector, the APEX ED, NEXUS and Night Owl. Member Mario Motta commented that he personally uses Starizona products and knows Steve's Dad. Others asked questions of Steve who was roundly applauded. Steven Koenig 520-292-5010 steve@starizonz.com www.starizona.com

Upcoming Outreach Events:
Charlotte County:
Tom Segur advised that the Solar observation will take place at Punta Gorda Public Library on April 12th from 9AM until Noon. He then stated that the FSW Moore Observatory event will take place on April 25th.

Lee County:
Brian Risley asked for as many as possible to attend the Earth Day Celebration at the Calusa Nature Center on April 19th between 10AM and 5PM for Solar observing. Brian also advised that two Seahawk Park parties are scheduled for April 26th and May 24th.

Officer and Committee Reports:
Vice President: Mike Jensen stated that 6 members met for dinner prior to tonight's meeting with lively discussions of their own scope adventures here and in other countries. He advised that he had no other issues regarding the Newsletter nor the Website.
Secretary: President Risley asked for a motion on Dan's secretary March minutes. Tom Segur advised that he had two amendments; a) page 38 Tom Klein should be amended to Tom Burkett, and b) page 39 Vera Heiner should be amended to Becky Brook. Dan stated that he would make such amendments.
Motion to accept the minutes as amended by Mike Jensen and seconded by Sean Dey, passed unanimously.
Treasurer: John MacLean repeated what was stated at the Annual Audit discussions, that our finances are in really good shape and that the 2025 budget can be met with around 100 members. Why? Because 60 of our 142 members have yet to pay their 2025 dues. John advised that he would send a separate email to each individual who has yet to pay. Both Mike Jensen and Brian Risley commented on the timing and the need for members to support our SWFAS.

Equipment Coordinator: Brian Risley advised that he is attempting to move various items to one or more individuals.

Program Coordinator: John MacLean and Dan Dannenhauer thanked member Mario Motta for being our May 1st speaker on Spring time Galaxies. Dan asked other members to assist.
There being no further business, President Risley asked for a motion to adjourn. Mike Jensen so moved, seconded by John MacLean, passed unanimously at 8:21PM.