



# The Eyepiece

SW FL Astronomical Society, Inc.  
PO Box 100127  
Cape Coral FL 33910



**October 6, 2022 General Meeting Cancelled  
Due to Hurricane Ian**

## 2022/23 Speaker Series

**October 6, 2022**

**November 3rd, 2022**

**December 1, 2022**



*Speaker To be  
rescheduled.*



**The Universe in  
the Infrared:  
Spitzer's Final Voyage**

**Dr. Luisa Rebull,  
Research Scientist,  
Caltech/IPAC**



**Forming the  
Brightest Galaxies  
in the Universe**

**Dr. Desika Narayanan,  
University of Florida**

**Dr. Fran Bagenal, Laboratory for  
Atmospheric and Space Physics  
University of Colorado, Boulder**

OPEN TO ALL SWFAS MEMBERS AND THE PUBLIC - More Info & Zoom Links at <https://theeyepiece.org/>

### Monthly Meetings

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

**This month's meeting will be a combined live and Zoom meeting! Masks are optional.**

Each meeting will have the same link/meeting ID (see below).

So, mark your calendar for:

- Oct. 6, 2022 -CANCELLED
- Nov. 3, 2022
- Dec. 1, 2022

For instructions on how to use Zoom to access our meetings, [click here](#). The actual link is

<https://widener.zoom.us/j/96535769204>

Meeting ID: 965 3576 9204

One tap mobile:  
+13126266799,,96535769204#  
(or)  
+16465588656,,96535769204#



- Solar Observing Oct. 1st - Ponce de Leon park, Punta Gorda
- FSW Observing Oct. 21
- Astro SIG Oct. 18 @6:30pm - Zoom
- Full Moon Oct. 9th
- New Moon Oct. 25th

### Observing Program Dates Announced

Below are the schedules for our Friday public nights at the FSW Observatory (3rd Friday of the month) and the Saturday Solar Observing events (1st Saturday of the month) at county parks.

#### FSW Observatory

- 10-21-22
- 11-18-22
- 12-16-22
- 1-20-23
- 2-17-23
- 3-17-23
- 4-21-23
- 5-19-23

#### Solar Observing/Park

- 10-1-22 / Ponce de Leon
- 11-5-22 / Bayshore Live Oak
- 12-3-22 / Gilchrist
- 1-7-23 / Ponce de Leon
- 2-4-23 / Bayshore Live Oak
- 3-4-23 / Gilchrist
- 4-1-23 / Ponce de Leon
- 5-6-23 / Bayshore Live Oak



### President's Report

Due to the effects of Hurricane Ian on our community and our members, we are cancelling our October 6, 2022 meeting.

We fully anticipate meeting as normal in November.

Please watch the website for updates.

### GUEST SPEAKER PRESENTATIONS SERIES

We are excited to announce the initiation of the new "SWFAS Guest Speaker Presentations" series of talks. These will cover astronomical science and space exploration along with practical astronomy and astrophotography talks by various subject matter experts. We are lining up prominent scientists and researchers to explain the science and technology behind the exciting discoveries being made in recent years in astronomy.

The following presentations are already scheduled and we will be firming up talks in 2023 on a month-to-month basis.:

October 6, 2022 CANCELLED

Dr. Fran Bagenal, University of Colorado  
Exploration of the Outer Solar System: New Horizons at Pluto and Juno at Jupiter

November 3, 2022

Dr. Luisa Rebull, NASA-IPAC  
The Universe in Infrared – Spitzer's Final Voyage

December 1, 2022

Dr. Desika Narayanan, University of Fla  
Forming the Brightest Galaxies in the Universe

January 2023

Craig Stocks - Utah Desert Remote Observatories - "Remote Imaging in the Utah Desert"

February 2, 2023

Dr. Thomas Pettiman,  
Planetary Science Institute Exploration of the Asteroid Belt

March 2, 2023

Dr. Eric Perlman - Florida Tech - Active galactic nuclei (supermassive black holes at the center of galaxies)

### Club Officers & Positions

President/Equipment  
Brian Risley  
[swfaspres@gmail.com](mailto:swfaspres@gmail.com)  
239-464-0366

Vice President/Programs  
Mike McCauley  
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860-982-5022

Secretary  
Don Palmer  
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Treasurer/AL Coordinator  
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Charlotte Event Coordinators  
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941-249-8726

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Mike Jensen  
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913-304-0495

Newsletter/Website  
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FSW Punta Gorda Moore Observatory  
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941-249-8726

Club Librarian  
Maria Berni  
239-940-2935

Club Historian  
Danny Secary  
[asecary@gmail.com](mailto:asecary@gmail.com)  
239-470-4764

Calusa Nature Center Planetarium Director  
Heather Preston  
[heather@calusanature.org](mailto:heather@calusanature.org)  
239-275-3435

## The Astronomical League Report



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 benefits for you, visit <http://www.astroleague.org>

### Reflector Magazine

You should have received an email from the Astronomical League linking to your digital copy of the September 2022 Quarterly Reflector magazine on around August 26, You can also directly access copies via the web at <https://www.astroleague.org/reflector>

### Monthly highlight of the Astronomical League Observing Programs

(Article prepared by SWFAS Astronomical League Coordinator John MacLean)

### The Astronomical League Herschel Observing Programs

We have previously covered the Messier and Caldwell lists. For the observer that has "bagged" both these lists, the Astronomical League provides two sequential programs that provide a "what's next" challenge to the advanced observer that can take several years to complete. Both lists are compiled from subsets of the 2,478 deep sky objects catalogued by William Herschel and his sister in the 1700s and subsequently included in the New General Catalog (NGC.) The use



of computerized Go-To technology for object acquisition is allowed.

### Herschel 400 Observing Program

This program had its origins around in the late seventies when members of the Ancient City Astronomers Club in St Augustine selected 400 objects that could be seen with a minimum of 6 inches aperture (the most popular instrument size of the day) in a relatively dark site. Seventeen of the objects are included in the Messier catalog and forty-four are included in the Caldwell listing. All objects are northern hemisphere targets. Included are 231 galaxies, 34 globular clusters, 6 nebulae, 100 open clusters, 5 combined clusters and nebulae, and 24 planetary nebulae. The AL website has the 400 targets listed by Constellation and by NGC number.

### Herschel II Observing Program

In 1997, another subset of 400 Herschel objects was selected by the Rose City Astronomers of Portland, Oregon as the Astronomical League's Herschel II list. This set is a step up from the first program and contains 323 galaxies, 41 open clusters, 21 nebulae, 9 planetary nebulae, 3 combines cluster nebulae, and 3 globular clusters. Most of the objects are between magnitude 11 and 13. Many will be visible with 8 inches aperture but 10 inches is specified as the minimum to ensure all are captured. The League also strongly suggests that observers wishing to formally attempt the program purchase the Herschel II Observing Program booklet from the League bookstore.

Additional Reading material regarding observing the Herschel catalog

A very interesting and useful resource on the web is well known author and frequent Sky & Telescope

contributor Rod Mollise's "Uncle Rod's Astro Blog." Between 2009 and 2012 Rod observed the entire 2,478 Herschel list. He started with the Herschel 400, the "best of the best", then moved on to the Herschel II list which took him a few more months using a 12 inch dob equipped with digital setting circles. The remainder of the 1,678 objects were completed over the next three years and the task is documented in the blog providing detail as to equipment and supporting software used - Google "Uncle Rod's Herschel Project". His instrument of choice was an 11 inch Go-To CAT.

Regarding the Herschel 400, Rod points out that certainly the objects are viewable with a 6 inch scope from a good dark site, but an 8 inch will provide more detail and a minimum of a 10 inch dob, like the Orion IntelliScope, would be ideal. He also points out the need in a project of this scope for planning software to keep track of completion status and to plan for the next observations (e.g. Skytools 3, Deep Sky Planner, Eye and Telescope) along with charting programs such as Stellarium and Cartes du Ciel.

In addition to the Astro League's Herschel II booklet, the following books are available for purchase:

- Herschel 400 Observing Guide by Stephen James O'Meara (used a 4 inch refractor, so charts are sometimes not so useful for those using larger apertures)
- The Herschel Objects and How to Observe Them by James Mullaney (covers the entire list)
- The Cambridge Atlas of Herschel Objects by James Mullaney and Wil Tirion (covers the entire list)
- The Downloadable Observing Guides section in Alvin Huey's faintfuzzies.com site provides a free resource for the listings and charts for both the Herschel 400 and Herschel II catalogs.



## Astronomical League - Awards

The Astronomical League presents awards to deserving people who have advanced the goals of the Astronomical League. These include promoting astronomy, contributing to the League, and advancing the science of astronomy. There are many awards that are presented. If you know someone who qualifies for an award, please contact the appropriate award administrator to get more information on nominating that person for the award.

The awards are presented to recognize people for their hard work and accomplishments and to encourage youngsters to study astronomy. Those wishing to receive awards for various observing programs should visit our observing club pages to determine who to contact.

[To view the AL awards, click here.](#)

## The Night Sky Network



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!



### Fomalhaut: Not So Lonely After All David Prosper

Fall evenings bring a prominent visitor to southern skies for Northern Hemisphere observers: the bright star **Fomalhaut!** Sometimes called “The Autumn Star,” Fomalhaut appears unusually distant from other bright stars in its section of sky, leading to its other nickname: “The Loneliest Star.” Since this star appears so low and lonely over the horizon for many observers, is so bright, and often wildly twinkles from atmospheric turbulence, Fomalhaut’s brief but bright seasonal appearance often inspires a few startled UFO reports. While definitely out of this world – Fomalhaut is about 25 light years distant from us – it has been extensively studied and is a fascinating, and very identified, stellar object.

Fomalhaut appears solitary, but it does in fact have company. Fomalhaut’s entourage includes two stellar companions, both of which keep their distance but are still gravitationally bound. Fomalhaut B (aka TW Piscis Austrini, not to be confused with former planetary candidate Fomalhaut b\*), is an orange dwarf star almost a light year distant from its parent star (Fomalhaut A), and Fomalhaut C (aka LP 876-10), a red dwarf star located a little over 3 light years from Fomalhaut A! Surprisingly far from its parent star – even from our view on Earth, Fomalhaut C lies in the constellation Aquarius, while Fomalhaut A and B lie in Piscis Australis, another constellation! – studies of Fomalhaut C confirm it as the third stellar member of the Fomalhaut system, its immense distance still within Fomalhaut A’s gravitational influence. So, while not truly “lonely,” Fomalhaut A’s companions do keep their distance.

Fomalhaut’s most famous feature is a massive and complex disc of debris spanning many billions of miles in diameter. This disc was first detected by NASA’s IRAS space telescope in the 1980s, and first imaged in visible light by Hubble in 2004. Studies by additional advanced telescopes, based both on Earth’s surface and in space, show the debris around Fomalhaut to be differentiated into several “rings” or “belts” of different sizes and types of materials. Complicating matters further, the disc is not centered on the star itself, but on a point approximately 1.4 billion miles away, or half a billion miles further from Fomalhaut than Saturn is from our own Sun! In the mid-2000s a candidate planetary body was imaged by Hubble and named Fomalhaut b. However, Fomalhaut b was observed to slowly fade over multiple years of observations, and its trajectory appeared to take it out of the system, which is curious behavior for a planet. Scientists now suspect that Hubble observed the shattered debris of a recent violent collision between two 125-mile wide bodies, their impact driving the remains of the now decidedly non-planetary Fomalhaut b out of the system! Interestingly enough, Fomalhaut A isn’t the only star in its system to host a dusty disc; Fomalhaut C also hosts a disc, detected by the Herschel Space Observatory in 2013. Despite their distance, the two stars may be exchanging material between their discs - including comets! Their co-mingling may help to explain the elliptical nature of both of the stars’ debris discs. The odd one out, Fomalhaut B does not possess a debris disc of its own, but may host at least one suspected planet.

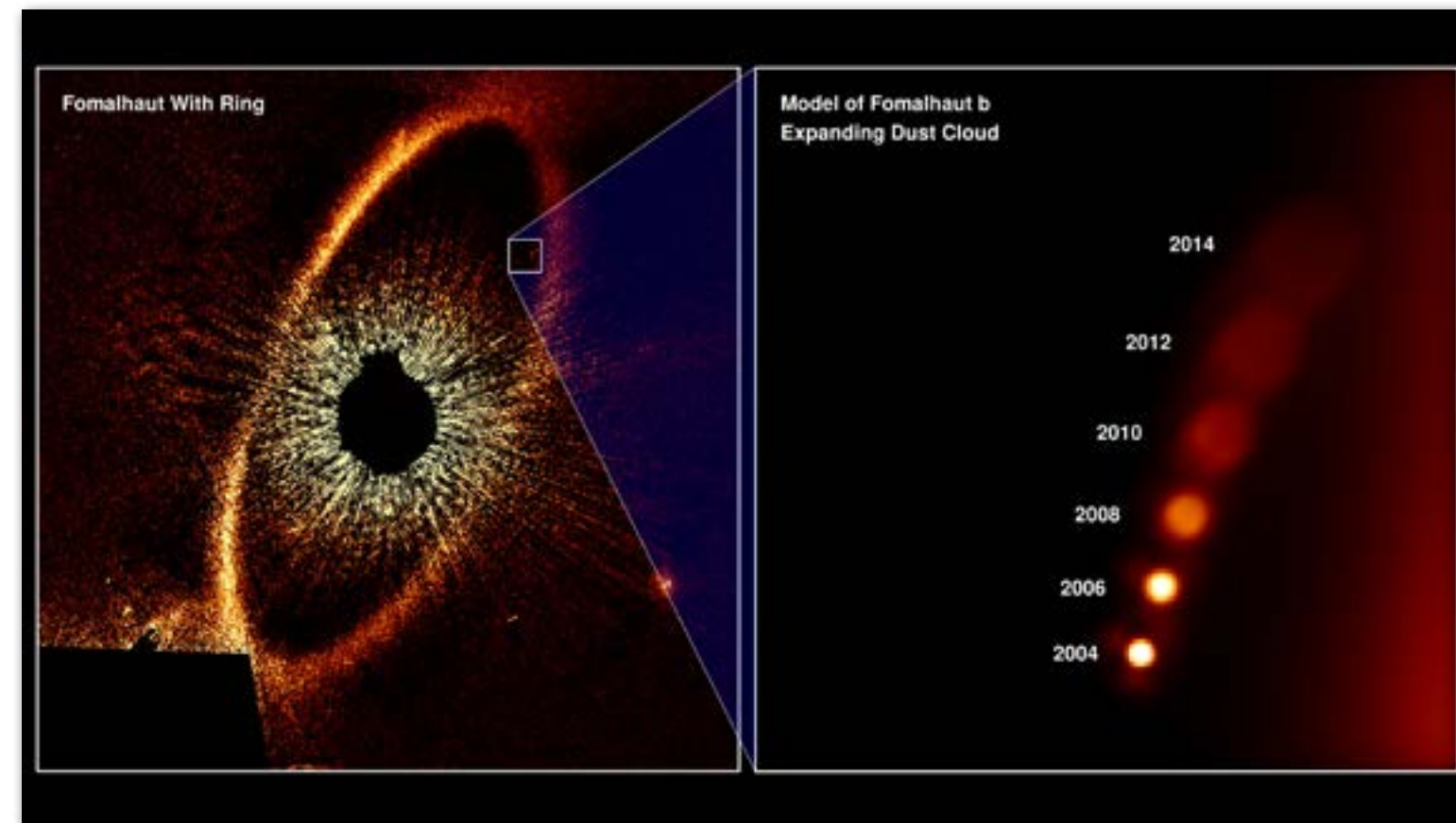
While Hubble imaged the infamous “imposter planet” of Fomalhaut b, very few planets have been directly imaged by powerful telescopes, but NASA’s James Webb Space Telescope will soon change that. In fact, Webb will be imaging Fomalhaut and its famous disc in the near future, and its tremendous power is sure to tease out more amazing discoveries from its dusty grains. You can learn about the latest discoveries from Webb and NASA’s other amazing missions at [nasa.gov](https://www.nasa.gov).

\*Astronomers use capital letters to label companion stars, while lowercase letters are used to label planets.



Sky map of the southern facing sky for mid-latitude Northern Hemisphere observers. With Fomalhaut lying so low for many observers, its fellow member stars in the constellation Piscis Australis won’t be easily visible for many without aid due to a combination of light pollution and atmospheric extinction (thick air dimming the light from the stars). Fomalhaut is by far the brightest star in its constellation, and is one of the brightest stars in the night sky. While the dim constellations of Aquarius and Capricorn may also not be visible to many without aid, they are outlined here. While known as the “Loneliest Star,” you can see that Fomalhaut has two relatively close and bright visitors this year: Jupiter and Saturn!

Illustration created with assistance from Stellarium



The magnificent and complex dust disc of the Fomalhaut system (left) with the path and dissolution of former planetary candidate Fomalhaut b displayed in detail (right).

Image credits: NASA, ESA, and A. Gáspár and G. Rieke (University of Arizona) Source: <https://www.nasa.gov/feature/goddard/2020/exoplanet-apparently-disappears-in-latest-hubble-observations>

## Astrophotography (SIG) Special Interest Group

Join Our Astrophotography Special Interest Group (SIG)  
– Mike Jensen, Group Lead

### REGULAR MEETINGS

*Regular meetings are usually on the Third Tuesday of each month,  
The next meeting is Tuesday Oct. 18th at 6:30*

<https://us02web.zoom.us/j/81077794455?pwd=MHJVL2VvZGZKR3JyM-1d5QVjZlZlTUT09>

Meeting ID: 810 7779 4455  
Passcode: Phot@S!G

### ABOUT THE ASTRO SIG

*Every month we get together on a Zoom call with a pretty loose agenda and manage to have an absolute blast talking about Astrophotography. I hope you'll join us if you're interested in Astrophotography.*

We have a nice, diverse group with a wide range of skill sets and interests. Some DSLR/Mirrorless shoot-

ers mixed in with telescope shooters. Some use Star Trackers, some use goto mounts, some use laptops and some use a fun little unit called the ASIAIR (a small little computer inside a box about the size of a cell phone that connects to a tablet or smart phone).

On any given day or moment we can shoot an email out to the group and get suggestions and answers, how cool is that?



Now, the REALLY cool thing is that it looks like the pandemic is FINALLY starting to ease off so that means we can finally start getting together and be safe! That means more helping each other, more show and tell, more mentorship which is exactly why we created the Astro SIG.

So, if you want to learn Astrophotography (like Astro 101) with a LOT of fun people, join us.

## Don't Make These Astrophotography Mistakes

By Mike Jensen

Whether you're a newbie or a seasoned pro, you're going to make some mistakes along the way. I would still call myself a relative novice at deep sky astro photography, BUT I am a professional photographer and I know that the basic components of photography apply to astro as well, whether it's wide field or a long reach. You still need to focus on the subject of your image!

When I decided to get more serious about astrophotography I joined SWFAS to learn more about astronomy and more about what I didn't know. I was a sponge for at least a year, and then decided to dip a toe in the water. After using a SA2i star tracker for about a year I decided to buy a goto mount and a deep sky telescope with all the trimmings. So, I jumped in to the water, placed my order and then proceeded to WAIT! I had placed my order in March of 2021 after EVERYONE in the world had decided they wanted to be astronomers during the Covid pandemic! So, all the suppliers were out of stock. After waiting patiently (not one of my strengths) I started to rattle the cages and finally got my mount after an 8 month delay. It was Nebula season so I borrowed a WO 61 from my friend Don and we got things going. Oh, I had also placed a pre order for the ASIAIR Plus. A GREAT decision despite being accused of going to the dark side!

**UNDER/OVEREXPOSING** - If you started out as a photographer and got in to Astro from the camera side of it, this can be a whole new world. If you got in to it from the astronomy side, you are probably less likely to have some exposure errors because you're used to the gear and the approach.

Everyone's favorite target is The Great Orion Nebula but it's actually a pretty hard target to get right because it's a star creating nebula and it's pretty darn bright! I've tackled it by using 30 second exposures.

**GAIN** - Make sure you know your camera's Gain tolerances. Gain is similar to ISO in a DSLR or Mirrorless camera. The higher the number, the more "noise" you get. I try to stick with 100 - 200. Remember, if you change your gain, you'll need new Darks, Bias and Flats.

**TEMPERATURE** - If you're dealing with a dedicated astro cooled camera you can cool the temp of your camera down to -40C, but in my area of Southwest Florida the best I can get is about -10C and that's only some times of the year. Remember, if you change your gain, you'll need new Darks, Bias and Flats.

**NOT KNOWING THE STARS** - When I first considered going in to deep sky object photography I took two astronomy classes and bought a couple of books on the stars to help me out. I also downloaded some apps to help me out. Start with knowing the brightest stars like Polaris (North Star), Betelgeuse (a great subject to use for focusing), and learn the key stars that correspond to the main constellations.

**NOT GETTING FOCUS CORRECTLY** - I recently switched my imaging system over from my long telescope to my wide field telescope. When doing so I set the back focus incorrectly. I was able to get great focus on my subject in the center of the field, but the outside stars were egg shaped, bad back focus. My imaging system couldn't manage the distance from the glass to the camera sensor. Know what that is!



## PixInsight Debuts New YouTube Tutorials

On Sept. 22nd PixInsight announced a new series of tutorials for 2022.

Five videos are now available on their YouTube channel with more to follow. See below.

<https://www.youtube.com/pixinsight>

The tutorials are dedicated to describing the graphical interface of PixInsight and its practical use at beginner to intermediate levels, from the most basic concepts such as workspaces, image windows and views, to more complex topics such as masks, processing histories, projects, and more.



*Astro SIG Images*

Bodies Island Lighthouse, Outer Banks N.C. by Phil Jansen

### Next Page - Elephant Trunk in RGB + SHO

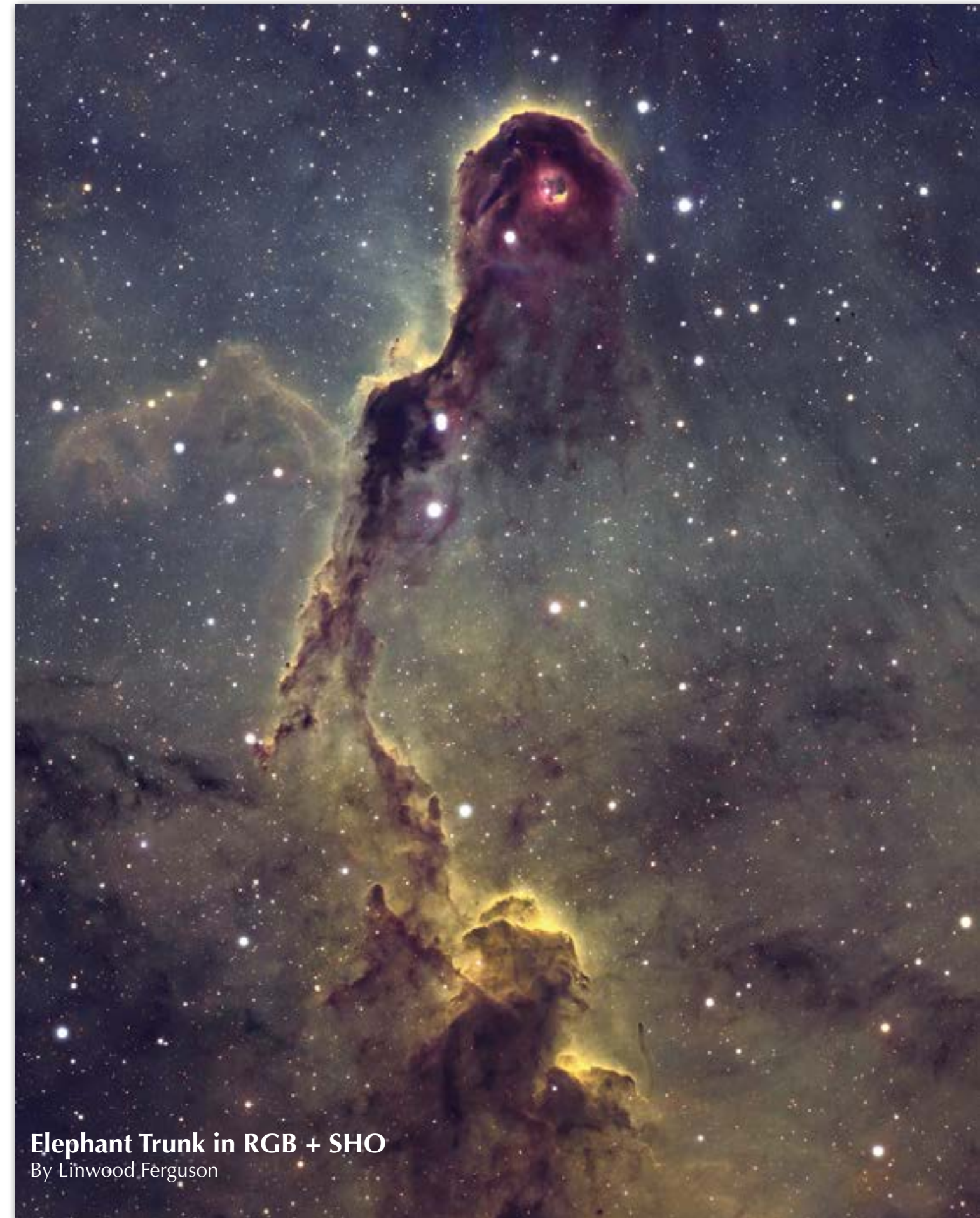
By Linwood Ferguson

This is the Elephant in a pseudo Hubble pallet, with RGB stars. Its detail is from narrow band data of about 36 hours, but the colors are a combination with relatively brief (5.9 hours in 240s exposures) of RGB data, with yet more brief (1.4 hours of 30s exposures) RGB to give me star colors (and reduce bloating by very short exposures) after removing both longer exposure RGB and NB stars. It's also my first attempt with StarXTerminator.

This is taken at 2800mm from my backyard over about 75 days in 5 sessions trying to find windows between rain.

The actual colors came from using 3 times the RGB vs Narrow Band, but using all filters for a synthetic luminance (deconvolved) for detail. The broadband color did not so much alter the colors and add some shape to the darker areas in the NB data. SCNR was used at 0.6 to shift some green after combining.

Follow Linwood on Astrobin at: <https://www.astrobin.com/users/Linwood/>



### Elephant Trunk in RGB + SHO

By Linwood Ferguson

## NASA clobbers an asteroid, What did we learn?

### From NASA

After 10 months flying in space, NASA's Double Asteroid Redirection Test (DART) – the world's first planetary defense technology demonstration – successfully impacted its asteroid target on Monday, the agency's first attempt to move an asteroid in space.

Mission control at the Johns Hopkins Applied Physics Laboratory (APL) in Laurel, Maryland, announced the successful impact at 7:14 p.m. EDT.

As a part of NASA's overall planetary defense strategy, DART's impact with the asteroid Dimorphos demonstrates a viable mitigation technique for protecting the planet from an Earth-bound asteroid or comet, if one were discovered.

"At its core, DART represents an unprecedented success for planetary defense, but it is also a mission of unity with a real benefit for all humanity," said NASA Administrator Bill Nelson. "As NASA studies the cosmos and our home planet, we're also working to protect that home, and this international collaboration turned science fiction into science fact, demonstrating one way to protect Earth."

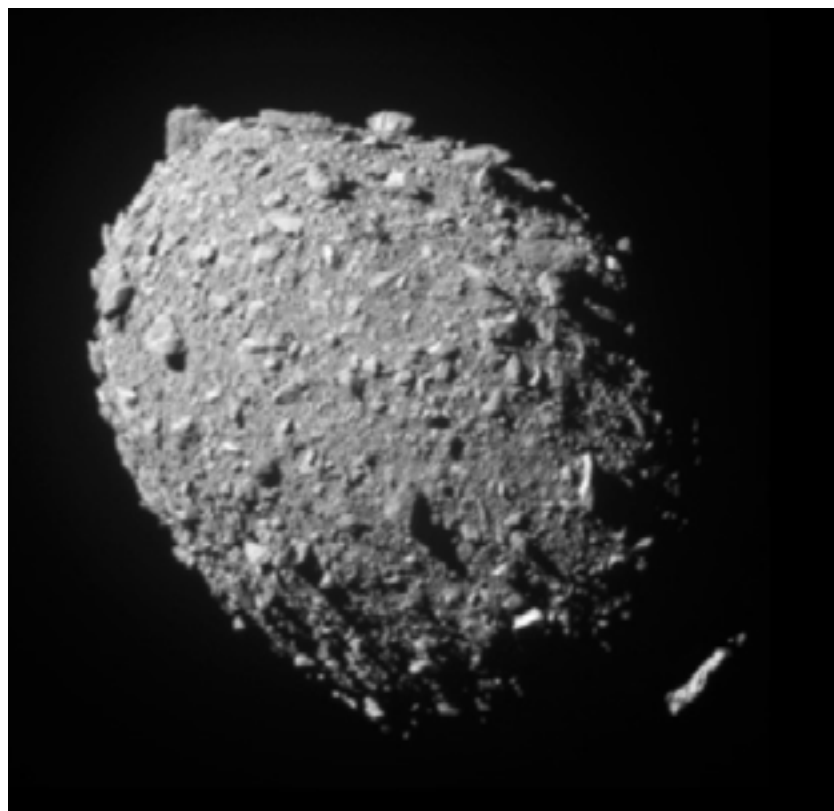
DART targeted the asteroid moonlet Dimorphos, a small body just 530 feet (160 meters) in diameter. It orbits a larger, 2,560-foot (780-meter) asteroid called Didymos. Neither asteroid poses a threat to Earth.

The mission's one-way trip confirmed NASA can successfully navigate a spacecraft to intentionally collide with an asteroid to deflect it, a technique known as kinetic impact.

The investigation team will now observe Dimorphos using ground-based telescopes to confirm that DART's impact altered the asteroid's orbit around Didymos. Researchers expect the impact to shorten Dimorphos' orbit by about 1%, or roughly 10 minutes; precisely measuring how much the asteroid was deflected is one of the primary purposes of the full-scale test.

"Planetary Defense is a globally unifying effort that affects everyone living on Earth," said Thomas Zurbuchen, associate administrator for the Science Mission Directorate at NASA Headquarters in Washington. "Now we know we can aim a spacecraft with the precision needed to impact even a small body in space. Just a small change in its speed is all we need to make a significant difference in the path an asteroid travels."

The spacecraft's sole instrument, the Didymos Reconnaissance and Asteroid Camera for Optical navigation (DRACO), together with a sophisticated guidance, navigation and control system that works in tandem with Small-body Maneuvering Autonomous Real Time Navigation (SMART Nav) algorithms, enabled DART to identi-



*Asteroid moonlet Dimorphos as seen by the DART spacecraft 11 seconds before impact.*

fy and distinguish between the two asteroids, targeting the smaller body.

These systems guided the 1,260-pound (570-kilogram) box-shaped spacecraft through the final 56,000 miles (90,000 kilometers) of space into Dimorphos, intentionally crashing into it at roughly 14,000 miles (22,530 kilometers) per hour to slightly slow the asteroid's orbital speed. DRACO's final images, obtained by the spacecraft seconds before impact, revealed the surface of Dimorphos in close-up detail.

Fifteen days before impact, DART's CubeSat companion Light Italian CubeSat for Imaging of Asteroids (LICIACube), provided by the Italian Space Agency, deployed from the spacecraft to capture images of DART's impact and of the asteroid's resulting cloud of ejected matter. In tandem with the images returned by DRACO, LICIACube's images are intended to provide a view of the collision's effects to help researchers better characterize the effectiveness of kinetic impact in deflecting an asteroid. Because LICIACube doesn't carry a large antenna, images will be downlinked to Earth one by one in the coming weeks.

"DART's success provides a significant addition to the essential toolbox we must have to protect Earth from a devastating impact by an asteroid," said Lindley Johnson, NASA's Planetary Defense Officer. "This demonstrates we are no longer powerless to prevent this type of natural disaster. Coupled with enhanced capabilities to accelerate finding the remaining hazardous asteroid population by our next Planetary Defense mission, the Near-Earth Object (NEO) Surveyor, a DART successor could provide what we need to save the day."

With the asteroid pair within 7 million miles (11 million kilometers) of Earth, a global team is using dozens of telescopes stationed around the world and in space to observe the asteroid system. Over the coming weeks, they will characterize the ejecta produced and precisely measure Dimorphos' orbital change to determine how effectively DART deflected the asteroid. The results will help validate and improve scientific computer models critical to predicting the effectiveness of this technique as a reliable method for asteroid deflection.

"This first-of-its-kind mission required incredible preparation and precision, and the team exceeded expectations on all counts," said APL Director Ralph Semmel. "Beyond the truly exciting success of the technology demonstration, capabilities based on DART could one day be used to change the course of an asteroid to protect our planet and preserve life on Earth as we know it."

Roughly four years from now, the European Space Agency's Hera project will conduct detailed surveys of both Dimorphos and Didymos, with a particular focus on the crater left by DART's collision and a precise measurement of Dimorphos' mass.

Johns Hopkins APL manages the DART mission for NASA's Planetary Defense Coordination Office as a project of the agency's Planetary Missions Program Office.

To see the final images before DART's impact, visit:

<https://go.nasa.gov/3Rer1NW>



## Artemis I rolls back to VAB ahead of Ian



At 11:21 p.m. ET Monday Sept 26th, NASA's Artemis I Moon rocket left launch pad 39B atop the crawler-transporter and began its 4-mile trek to the Vehicle Assembly Building (VAB) at NASA's Kennedy Space Center in Florida.



Managers decided to roll back based on the latest weather predictions associated with Hurricane Ian not showing improving expected conditions for the Kennedy area. The decision allows time for employees to address the needs of their families and protect the integrated rocket and spacecraft system.

At approximately 9:15 a.m. EDT Tuesday Sept. 27th, NASA's Space Launch System (SLS) rocket and Orion spacecraft for the Artemis I mission were secured inside the Vehicle Assembly Building at the agency's Kennedy Space Center after a four-mile journey from Launch Pad 39B that began at 11:21 p.m. Monday, Sept. 26 ahead of the arrival of Hurricane Ian.



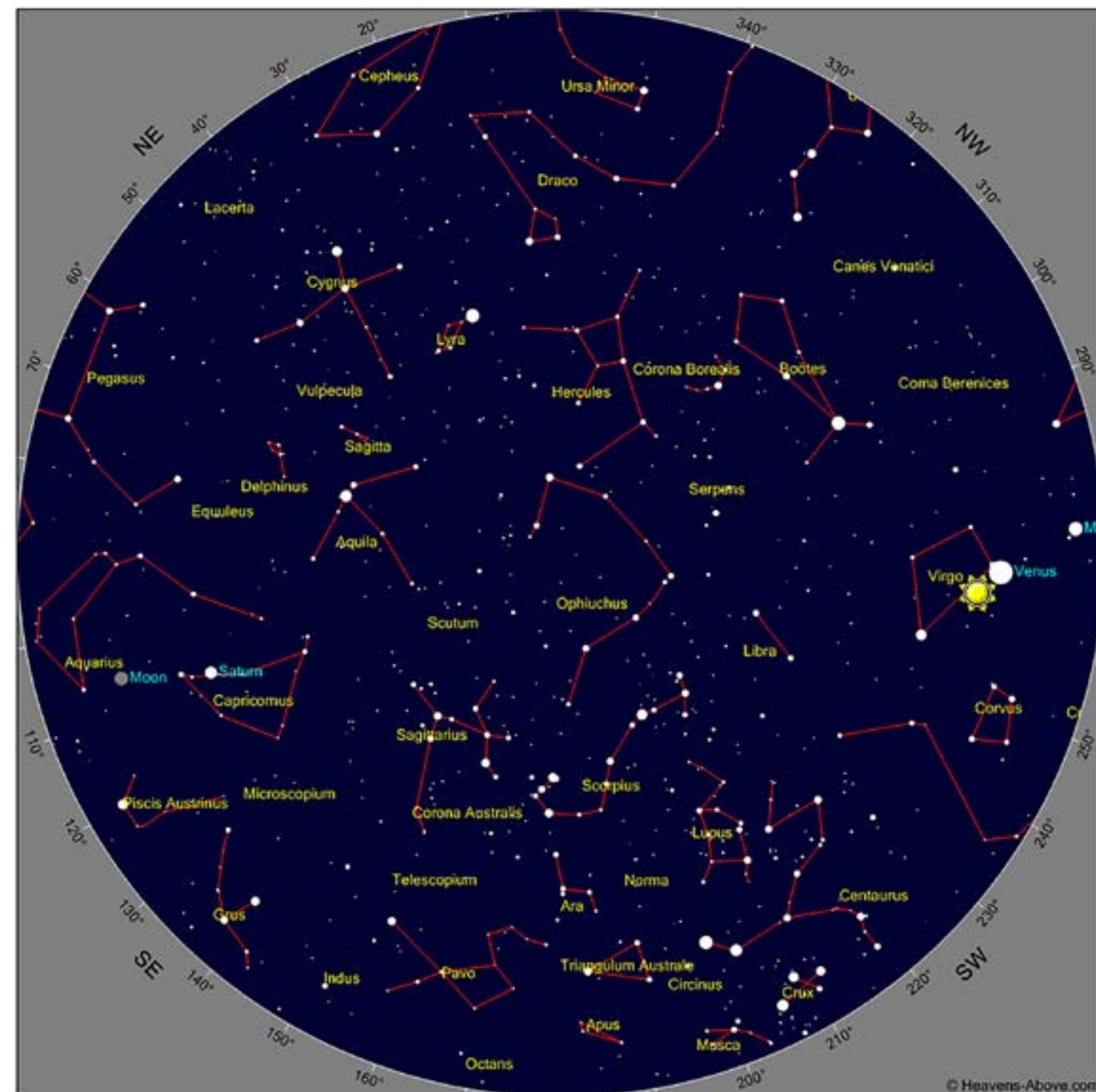
After the storm has passed, teams will conduct inspections to determine impacts at the center and establish a forward plan for the next launch attempt, including replacing the core stage flight termination system batteries and retesting the system to ensure it can terminate the flight if necessary for public safety in the event of an emergency during launch.

## ABOUT

Artemis is the first step in the next era of human exploration. Together with commercial and international partners, NASA will establish a sustainable presence on the Moon to prepare for missions to Mars.

This blog will be a source of information on Artemis launch and exploration progress, covering updates across our science, technology and human exploration programs. Once we're ready to fly, check out this blog for launch updates and other mission operations.

## OCT 2022 Sky Chart



You can download or view this map better at: <https://heavens-above.com/skychart2.aspx?lat=0&lng=0&loc=Unspecified&alt=0&tz=UCT>



## Planet Positions

Click on the graphic above to go to Time and Date for a great simulation of the rotation of the constellations and the rising/setting of the planets. The chart below is set for April 7th but can be programmed for any date and time. The chart can also be found at [this link on Heavens Above](#).

### Planet Summary

Ho

Year  Month  Day  Time

	Mercury	Venus	Mars	Jupiter	Saturn	Uranus	Neptune	Pluto
Right ascension	11 <sup>h</sup> 45 <sup>m</sup> 5.0 <sup>s</sup>	12 <sup>h</sup> 34 <sup>m</sup> 46.2 <sup>s</sup>	5 <sup>h</sup> 23 <sup>m</sup> 26.7 <sup>s</sup>	0 <sup>h</sup> 10 <sup>m</sup> 9.8 <sup>s</sup>	21 <sup>h</sup> 25 <sup>m</sup> 24.8 <sup>s</sup>	3 <sup>h</sup> 2 <sup>m</sup> 5.0 <sup>s</sup>	23 <sup>h</sup> 36 <sup>m</sup> 52.7 <sup>s</sup>	19 <sup>h</sup> 52 <sup>m</sup> 55.1 <sup>s</sup>
Declination	2° 49' 54"	-2° 15' 34"	22° 41' 46"	-0° 39' 41"	-16° 31' 49"	16° 47' 51"	-3° 50' 0"	-23° 8' 42"
Range (AU)	0.903	1.713	0.751	3.970	9.244	18.853	28.973	34.386
Elongation from Sun	17.7°	4.4°	111.5°	168.9°	125.4°	145.2°	160.0°	102.7°
Brightness	-0.1	-3.8	-0.7	-2.8	0.5	5.7	7.8	14.4
Equatorial Diameter	7.45"	9.74"	12.46"	49.66"	17.98"	3.74"	2.36"	0.10"
Phase Angle	99.3°	6.1°	39.8°	2.2°	4.7°	1.7°	0.7°	1.6°
Constellation	Virgo	Virgo	Taurus	Pisces	Capricornus	Aries	Aquarius	Sagittarius
Meridian transit	10:44	11:33	04:24	23:07	20:23	02:03	22:35	18:51
Rises	04:44	05:33	22:22	17:09	14:25	20:00	16:36	12:52
Sets	16:44	17:34	10:23	05:11	02:27	08:02	04:38	00:54
Altitude	4.2°	16.6°	-67.3°	-10.4°	29.3°	-50.2°	-2.1°	48.0°
Azimuth	272.8°	267.6°	2.9°	90.7°	109.1°	63.1°	93.8°	125.9°
Inferior Conjunction	2022-Sep-23 2023-Jan-07	2022-Jan-09 2023-Aug-13	-	-	-	-	-	-
Opposition	-	-	2020-Oct-13 2022-Dec-08	2022-Sep-26 2023-Nov-03	2022-Aug-14 2023-Aug-27	2021-Nov-04 2022-Nov-09	2022-Sep-16 2023-Sep-19	2022-Jul-20 2023-Jul-22
Superior Conjunction	2022-Jul-16 2022-Nov-08	2021-Mar-26 2022-Oct-22	2021-Oct-08 2023-Nov-18	2022-Mar-05 2023-Apr-11	2022-Feb-04 2023-Feb-16	2022-May-05 2023-May-09	2022-Mar-13 2023-Mar-15	2022-Jan-16 2023-Jan-18
Max. eastern elongation	2022-Aug-27 2022-Dec-21	2021-Oct-29 2023-Jun-04	-	-	-	-	-	-
Max. western elongation	2022-Jun-16 2022-Oct-08	2022-Mar-20 2023-Oct-23	-	-	-	-	-	-
Perihelion	2022-Jul-10 2022-Oct-06	2022-Sep-04 2023-Apr-17	2022-Jun-21 2024-May-08	2011-Mar-17 2023-Jan-20	2003-Jul-26 2032-Nov-28	1966-May-22 2050-Aug-17	1876-Aug-26 2042-Sep-03	1989-Sep-05 2237-Sep-15
Aphelion	2022-Aug-23 2022-Nov-19	2022-May-15 2022-Dec-26	2021-Jul-13 2023-May-30	2017-Feb-17 2028-Dec-28	2018-Apr-17 2047-Jul-15	2009-Feb-27 2092-Nov-23	1959-Jul-17 2125-Dec-01	1866-Jun-04 2114-Feb-19