

THE ASTRONEWS



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October 2022

www.hawastsoc.org

A word from your editor by Sapavith 'Ort' Vanapraks

As Oahu COVID-19 case count daily average continues to stay high (105+), our HAS monthly meeting will continue to be an online meeting. Our public star party and school star party is also on hold. Let's hope that situation gets better by this summer so we can all go back to a similar life as 2019. At that time, we will announce it on our HAS website and in the AstroNews. Meanwhile, we will continue to have the club member only star party. We will be limiting the club party to the key master and 24 extra members. All attendees must be fully vaccinated. The monthly club meeting is now being done remotely via Zoom. Please check your email and website for an update.

Artemis I launching did not happen on Saturday, Sept. 3 at 2:17 p.m. EDT. The NASA team was able to fix the fuel leak and has a new launch schedule set for Tuesday, 9/27/2022, at 11:37 AM EDT. However, mother nature interfered like many astronomy events. Hurricane Ian is headed up toward Florida. NASA will roll the Artemis I Space Launch System rocket and Orion spacecraft back to the Vehicle Assembly Building on Monday, Sept. 26. First motion is targeted for 11 p.m. EDT.

... But not all are lost. On this very day, NASA has another mission, the Double Asteroid Rendezvous Test (DART) probe. The DART probe was launched on Nov. 24, 2021 at 1:20 a.m. EDT (0620 GMT) from Space Launch Complex 4, Vandenberg Space Force Base in California. It took just over 10

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Upcoming Events:

- The next Board meeting is Sun., Oct. 2nd 3:30 PM. **(Zoom Meeting)**
- The next meeting is on Tue., Oct. 4th at the Bishop Museum at 7:30 PM. —**Zoom Meeting**
- Bishop Museum's planetarium shows are every 1st Saturday of the month at 8:00 PM **(Online)** www.bishopmuseum.org/calendar

President's Message October 2022

New COVID infections in Hawaii continue to trend downward, so the Board is considering resuming in-person meetings and star parties in November. We will make a decision on this soon.

I hope we can resume our star parties, because Saturn is well up at sunset now, and Jupiter has just passed opposition. I'm sure we'll have a lot of guests at our events who are eager to soak in these celestial delights again. By November, even Mars will be rising fairly early in the evening.

You have probably heard about the success of the DART (Double Asteroid Redirection Test) mission that collided as planned with Dimorphos, the 160-m satellite of sub-kilometer near-Earth asteroid Didymos. The moon appears to be a rubble-pile asteroid, so it will be interesting to see if that may have had any influence on the transfer of energy from the spacecraft to the asteroid.

It may be necessary someday to divert an asteroid that would otherwise collide with Earth. Impacting it to change its trajectory is one possible way to do that, so this is an early test of the physics involved. It will take a couple of months to precisely determine the period of the new orbit and how much it differs from the pre-impact one, but preliminary results should be known sooner. It's really any tiny difference from the expected outcome that will be the most interesting to observe and explain.

The final image taken by the impactor was a partial image reminiscent of those taken by the Ranger series of spacecraft that impacted Earth's Moon in the 1960s. A companion CubeSat provided by the Italian Space Agency transmitted some images of ejecta produced by the impact, and another CubeSat mission is being developed by the European Space Agency to do a detailed reconnaissance and assessment of the impact site in 2027.

We have many examples of craters on the Moon and elsewhere, but we can only speculate on the size, composition, and speed of the impactors that caused them. This will be one

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Observer's Notebook—October 2022 by Ort

Planets Close to the Moon

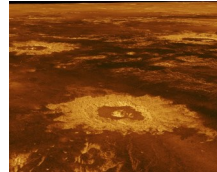
Times are Hawaii Standard Time

- Oct 5, 9h, Moon 3.9° SE of Saturn; 126° from Sun in evening sky; magnitudes -11.4 and 0.6
- Oct 7, 20h, Moon 2.79° SE of Neptune; 159° from Sun in evening sky; magnitudes -12.2 and 7.8
- Oct 8, 11h, Moon 1.87° SE of Jupiter; 167° and 166° from Sun in evening sky; magnitudes -12.4 and -2.9
- Oct 11, 21h, Moon 0.80° N of Uranus; 151° from Sun in morning sky; magnitudes -11.9 and 5.7; occultation
- Oct 14, 18h, Moon 3.6° N of Mars; 118° from Sun in morning sky; magnitudes -11.0 and -0.9
- Oct 24, 7h, Moon 0.39° NE of Mercury; 10° from Sun in morning sky; magnitudes -5.0 and -1.1
- Oct 25, 3h, Moon 0.20° ESE of Venus; 1° from Sun in evening sky; magnitudes -4.1 and -3.9

Other Events of Interest

Times are Hawaii Standard Time










- Oct 8, 11h, Mercury at westernmost elongation; 18.0° from Sun in morning sky; magnitude -0.5
- Oct 8, 15h, Draconid meteors; ZHR 10; 1 day before Full Moon
- Oct 19, 6h, Venus brightest; magnitude -3.93°
- Oct 21, 0h, Orionid meteors; ZHR 20; 4 days before New Moon



Three impact craters are displayed in this three-dimensional perspective view of Venus' surface. The center of the image is located at approximately 27 degrees south latitude, 339 degrees east longitude in the northwestern portion of Lavinia Planitia.

Image credit: NASA/JPL

Planets in October

<p> Mercury</p> <p>Good morning appearance for most of October.</p>	<p> Venus</p> <p>Bright morning planet, rises 40 minutes before sunrise at start of October, lost soon thereafter. Superior conjunction 22 October.</p>	<p> Mars</p> <p>Rises around 21:30 BST at the start of October. Brightens throughout the month.</p>
<p> Jupiter</p> <p>Bright and well placed. Almost full Moon nearby on evening of 8 October.</p>	<p> Saturn</p> <p>Well positioned evening planet. Bright waxing gibbous Moon nearby on evening of 5 October.</p>	<p> Uranus</p> <p>Well placed for viewing in southern Aries. Approaching opposition on 9 November.</p>
<p> Neptune</p> <p>Well positioned binocular planet near Jupiter and below the Circllet asterism in Pisces.</p>	<p> Pluto (Dwarf Planet)</p> <p>is visible in the evening sky, becoming accessible around 19:26 (HST), 41° above your south-eastern horizon, as dusk fades to darkness.</p>	<p> 4—Vesta (Asteroid)</p> <p>is visible in the evening sky, becoming accessible around 19:26 (HST), 23° above your south-eastern horizon, as dusk fades to darkness.</p>

Meeting called to order at 7:31 pm. By President Chris Peterson. 18 participants were present.

Minutes of the August meeting were adopted, with corrected typos.

The event at Bishop Museum last Saturday went well, with members Chris, Mark, and Marufa assisting. Our contact, Tony Smith, announced he will be leaving BM this month.

Hybrid meetings at the Bishop Museum Planetarium are still on the agenda, perhaps as early as November.

Dillingham/Kawaihapai Airfield has undergone some changes in security personnel. Board members are working to maintain a good relation with the airport authority.

There has been some discussion about extending star-party times, especially by those engaged in astrophotography. We may be looking into amending the bylaws to allow non-board members to take the role of Keymaster, for club star-parties.

The Reiner-Gamma challenge continues. We had several photos, and helpful guides for locating the feature, and some discussion of the Looney 11 rule (https://en.wikipedia.org/wiki/Looney_11_rule).

We also had some photos and discussion of the Apollo 11 Mission, being that it is the anniversary. Steve Chun shared some photos of the landing site.

Andy shared some directions on how to plate solve on line, using Astrometry.com.

Chris had updates on the Artemis program, and possible south pole landings on the Moon.

Peter shared some information about the recent dimming of Betelgeuse, which may have been due to a Coronal Mass Ejection (CME), and some recent pictures from the JWST of exoplanets, and the inner workings of the Tarantala Nebula.

Meeting was adjourned at 9:25 pm. There were 20 participants, at maximum.

Faithfully and dutifully submitted, James Andy Stroble, Secretary.

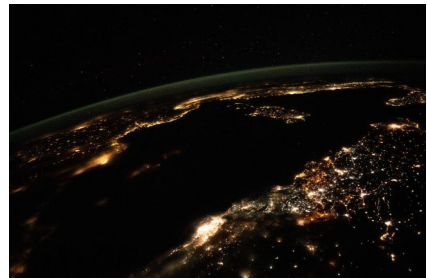
(Continued from page 2 - President's Message)

of only a handful of craters where the characteristics of the impactor is known, so study of it should advance our understanding of the impact process that is so common and important to the geologic history of solar system bodies.

Mediterranean Cities Light Up the Night

This nighttime photograph from the International Space Station (ISS) as it orbited 261 miles above Earth looks across the Mediterranean Sea from north Africa to southern Europe.

Image credit: NASA



Hawaiian Astronomical Society
Event Calendar

October 2022						
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
						1
2  1st Qtr 2:14 PM BoD Meeting 3:30 PM Zoom	3	4 Club Meeting 7:30 PM Zoom	5	6	7	8
9  Full 10:54 AM	10 Columbus Day	11	12	13	14	15 Club Party Dillingham Airfield Sunset 6:06 PM
16	17  3rd Qtr 7:15 AM	18	19	20	21	22 Club Party Dillingham Airfield Sunset 6:01 PM
23	24	25  New 12:48 AM	26	27	28	29
30	31 Halloween	Notes:				

<<Upcoming Star Parties>>

- Club Party-Dillingham October 15 —7:00 PM**
- Club Party Dillingham October 22 —7:00 PM**
- Public Party Geiger/Kahala October 1 — CANCELLED**

Upcoming School Star Parties

NASA's Night Sky Notes

Fomalhaut: Not So Lonely After All

By David Prosper



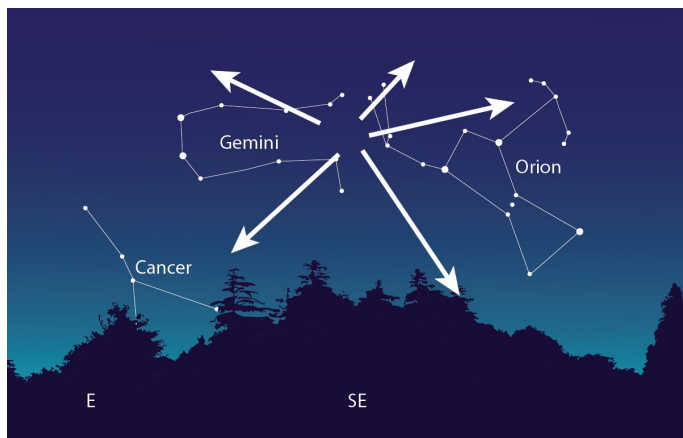
Fall evenings bring a prominent visitor to southern skies for Northern Hemisphere observers: the bright star Fomalhaut! Sometimes called “The Autumn Star,” Fomalhaut appears unusually distant from other bright stars in its section of sky, leading to its other nickname: “The Loneliest Star.” Since this 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.

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The Draconids (009 DRA) have doubled their ZHR since last year, from 5 to 10 per hour. Might be worth a look! The Orionids, slightly affected by the waning crescent Moon, are a medium strength shower that sometimes reaches high strength activity. In a normal year the Orionids produce 10-20 shower members at maximum. In exceptional years, such as 2006-2009, the peak rates were on par with the Perseids (40-70 per hour on consecutive nights). Recent displays have produced low to average displays of this shower. Halley’s comet (1P/Halley) is the parent comet of the Orionids.



The Orionid radiant (courtesy <https://www.astrocal.co.uk/>)

Phases of the Moon (courtesy timeanddate.com)

First Quarter	Full Moon	Last Quarter	New Moon
October 02	October 09	October 17	October 25

Shower	Activity	Maximum		Radiant		V_{∞} km/s	r	ZHR
		Date	λ_{\odot}	α	δ			
Oct. Camelopard. (281 OCT)	Oct 05 - Oct 6	Oct 06	192.58°	164°	+79°	47	2.5	5
Draconids (009 DRA)	Oct 06 - Oct 10	Oct 09	195.4°	262°	+54°	20	2.6	10
Southern Taurids (002 STA)	Sep 10 - Nov 20	Oct 10	197°	32°	+09°	27	2.3	5
δ -Aurigids (224 DAU)	Oct 10 - Oct 18	Oct 11	198°	84°	+44°	64	3.0	2
ϵ -Geminids (023 EGE)	Oct 14 - Oct 27	Oct 18	205°	102°	+27°	70	3.0	3
Orionids (008 ORI)	Oct 02 - Nov 07	Oct 21	208°	95°	+16°	66	2.5	20
Leo Minorids (022 LMI)	Oct 19 - Oct 27	Oct 24	211°	162°	+37°	62	3.0	2

Always a safe activity – plan to go outside and observe meteors! For more info contact: Tom Giguere, 808-782-1408, Thomas.giguere@yahoo.com; Mike Morrow, PO Box 6692, Ocean View, HI 96737.

Cash Flow - 8/11/2022 to 9/10/2022

Beginning Balance	\$4,719.69
Money into selected accounts comes from	
Total Money In	\$0.00
Money out of selected accounts goes to	
	\$0.00
Total Money Out	\$0.00
Difference	\$0.00
Ending Balance	\$4,719.69

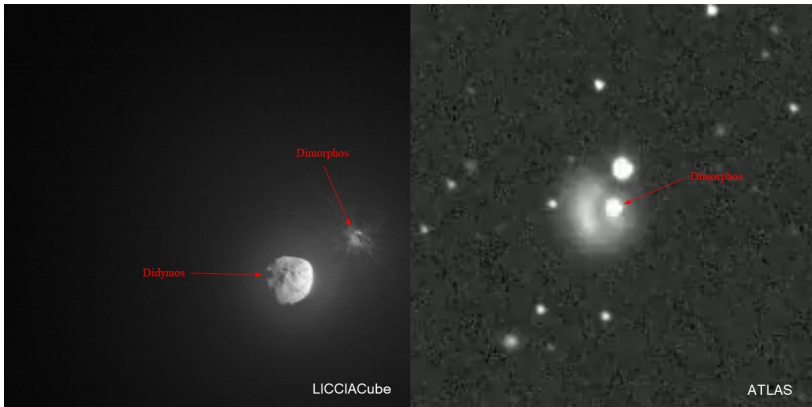
No expenditures or income this month, though I have processed quite a number of renewals and new memberships this month. Thanks also for the donations. Our liability insurance was also paid.

On the Covid front, the main news is that the health department added 11,000 new cases to the list that they had missed, somehow. Essentially this means that Hawaii's Covid reporting is so bad as to be virtually meaningless. I hope all of you have gotten your bivalent booster shot, which may help against the dominant BA5 strain. After BA5 comes BA2.75.2 and BQ1.1, two nasties that render our anti-viral treatments ineffective. Avoid indoor meetings, and mask up (N95) in groups or indoors.

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(Continued from page 1) - word from your editor

months to arrive and impact Asteroid Dimorphos (Satellite of Asteroid Didymos) on Sept. 26, 2022 at 7:14 p.m. EDT (2314 GMT).

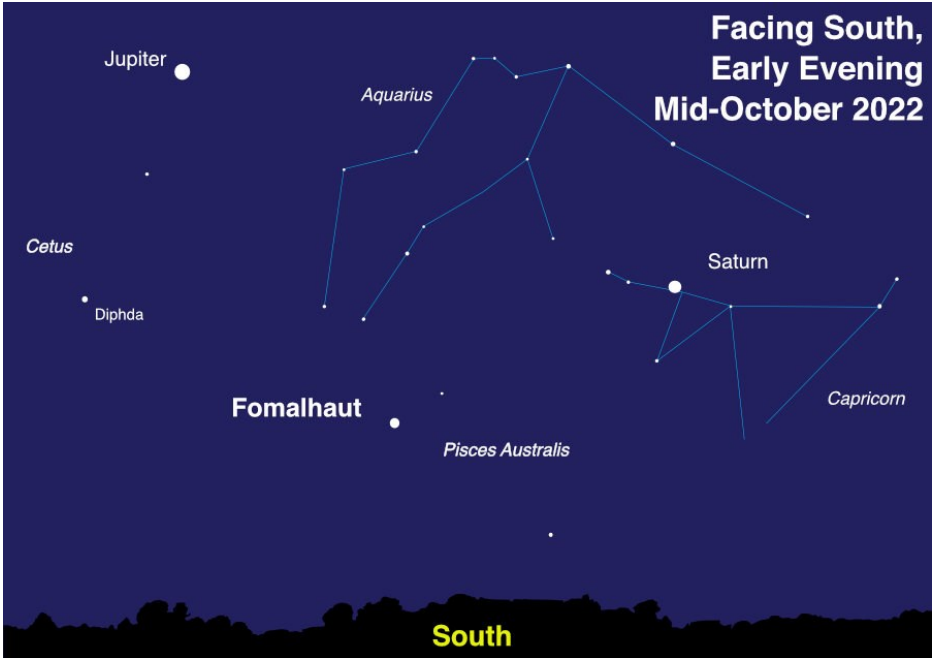


(Continued on page 10)

(Continued from page 6) NASA's Night Sky Notes

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.

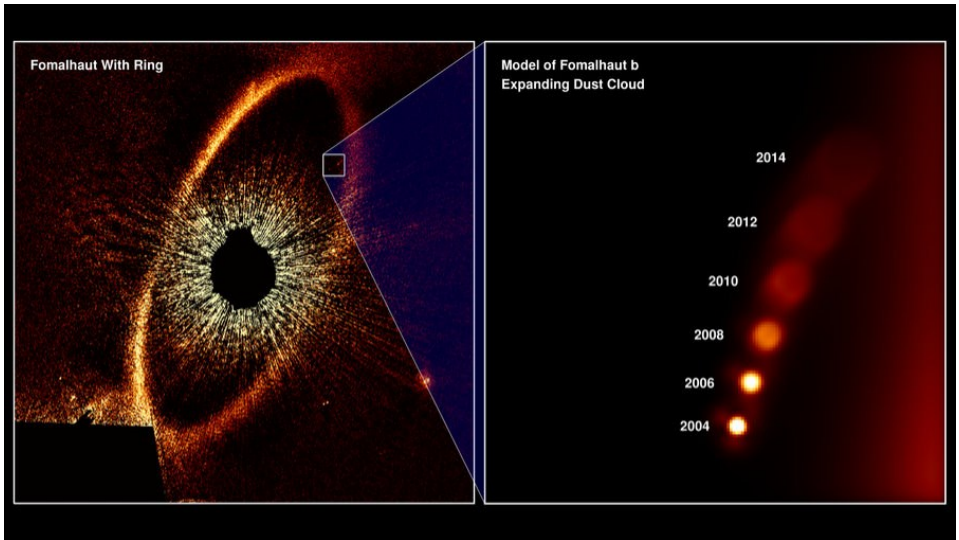
*Astronomers use capital letters to label companion stars, while lowercase letters are used to label planets



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

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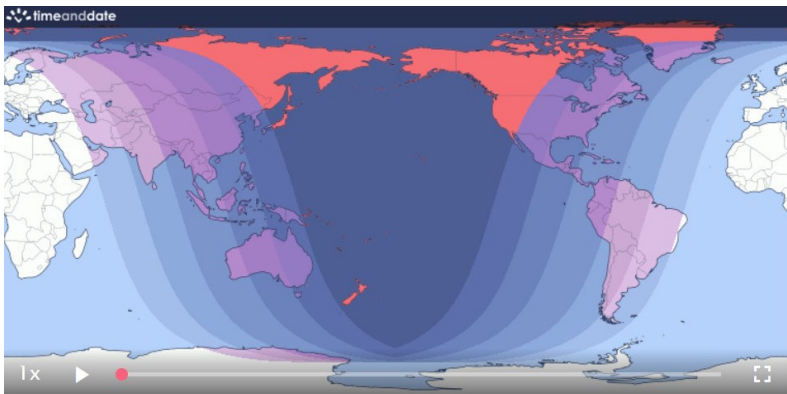


The magnificent and complex dust disc of the Fomalhaut system (left) with the path and dissolution of former planetary candidate Fomalhaut b displayed in detail (right).

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>

(Continued from page 8) - word from your editor

By the time we have our club meeting on November, 8, 2022, people from Russia, Japan, New Zealand, Canada, Alaska, and our Hawaii will get to observe the Total Lunar Eclipse. The lunar Eclipse in Hawaii started on Monday, November 7, 2022, at 10:02 PM. Maximum Eclipse will happen on Tuesday, November 8, 2022, at 12:59 AM and ended at 3:56 AM. Hope some of us get to enjoy it. Show us your photos in the meeting.





A Cosmic Tarantula, Caught by NASA's Webb

In this mosaic image stretching 340 light-years across, Webb's Near-Infrared Camera (NIRCam) displays the Tarantula Nebula star-forming region in a new light, including tens of thousands of never-before-seen young stars that were previously shrouded in cosmic dust. The most active region appears to sparkle with massive young stars, appearing pale blue..

Credits: NASA, ESA, CSA, STScI, Webb ERO Production Team



Setting the Clock on a Stellar Explosion

The supernova remnant called SNR 0519-69.0 (SNR 0519 for short) is the debris from an explosion of a white dwarf star. After reaching a critical mass, either by pulling matter from a companion star or merging with another white dwarf, the star underwent a thermonuclear explosion and was destroyed. Scientists use this type of supernova, called a Type Ia, for a wide range of scientific studies ranging from studies of thermonuclear explosions to measuring distances to galaxies across billions of light-years.

Image credit: X-ray: NASA/CXC/GSFC/B. J. Williams et al.; Optical: NASA/ESA/STScI



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Golden DART's Galactic Unboxing

Technicians prepare to move NASA's Double Asteroid Redirection Test (DART) spacecraft onto a work stand inside the Astrotech Space Operations Facility at Vandenberg Space Force Base in California following its arrival at the facility on Oct. 4, 2021.

Image Credit: USSF 30th Space Wing/Aaron Taubm