

SKYWATCHER NEWSLETTER

LATEST NEWS

This has been a busy month for Space News. The DART Mission press releases and the launch of the Bluewalker 3 plus the latest astronauts to join the ISS.

If you haven't come across the Bluewalker 3 launched by SpaceX, it is worth reading up on this 64 sq m solar panel array and how this will likely impact our night sky when fully deployed. They intend to launch 100 of these behemoths in the near future.

Until next month... SLK

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!

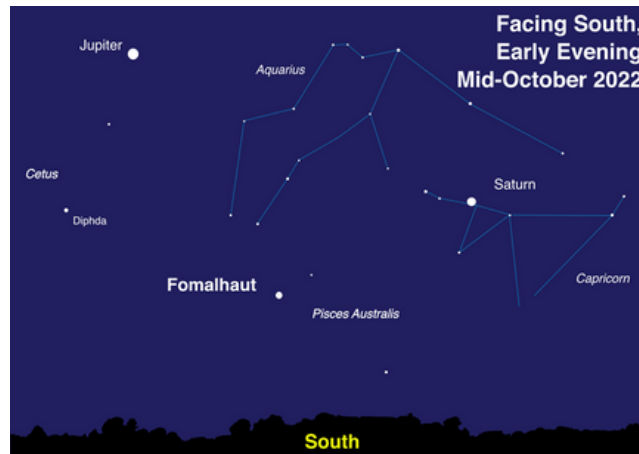
– studies of Fomalhaut C confirm it as the third stellar member of the Fomalhaut system, its immense distance still within Fomalhaut A's gravitational influence. So, while not truly "lonely," Fomalhaut A's companions do keep their distance.

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

LOCAL EVENTS

Oct 19 - CADAS - Hugh Allen Spectroscopy : Cracking starlight's hidden code

Nov 1 - WAS - James Fradgley The angular momentum problem: why do stars spin so slowly?

Nov 16 - CADAS - Steve Tonkin Ten Ways the Universe Tries to Kill You

Dec 6 - WAS - Christmas Social and Members 10 Minute Talks

Dec 21 - CADAS - Christmas Social and members' short talks

VISIT OUR WEBSITE FOR THE LATEST CLUB INFORMATION

SKYWATCHER NEWSLETTER



EUROPA AT POINT-BLANK RANGE

spaceweather.com 30 Sept 2022

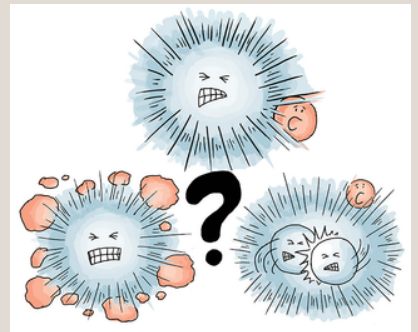


The first pictures from Juno's flyby of Europa on Sept 29th have arrived on Earth, and they are beautiful. At closest approach, the spacecraft was only 219 miles (352 km) above the ocean moon's icy crust, revealing cryovolcanic ridges, strangely curvaceous fractures, and frozen "rafts."

Image portion at top of page. Credit: NASA/SwRI/MSSS/Navaneeth Krishnan S

This is only the third close pass in history below 310 miles (500 kilometers) altitude and the closest look at Europa any spacecraft has gotten since Jan. 3, 2000, when NASA's Galileo spacecraft came within 218 miles (351 kilometers) of the surface.

At closest approach, Juno was directly above a region of chaos terrain called "Anwn Regio" where rafts of ice had previously broken free and re-frozen. Researchers suspected that water from beneath Anwn Regio must be breaking through from time to time. Researchers will be looking carefully at these images to see if anything has changed since Galileo visited 20+ years ago.

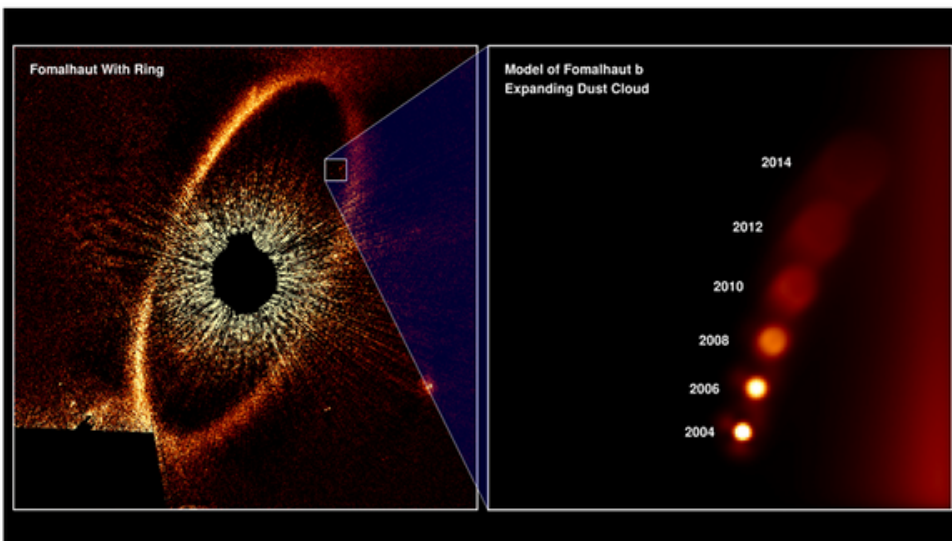


WAC Upcoming Events

Nov 11 - Sheri Karl - The GAIA Mission (Face to face and Zoom)

Dec 9 - John Macdonald - The Astronomical Unit (Face to face and Zoom)

MORE TO COME IN 2023!



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>

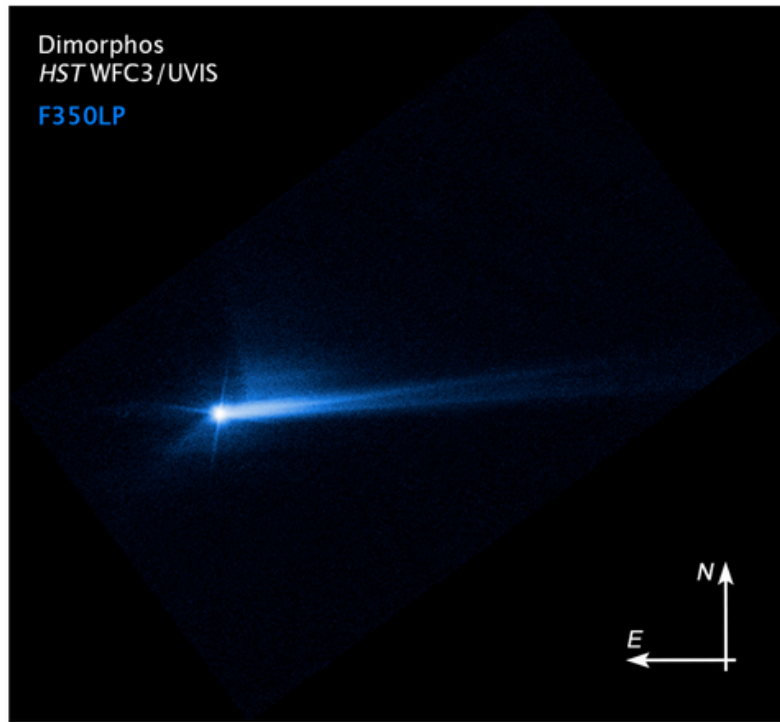


NASA DART Imagery Shows Changed Orbit of Target Asteroid

Analysis of data obtained over the past two weeks by NASA's Double Asteroid Redirection Test (DART) investigation team shows the spacecraft's kinetic impact with its target asteroid, Dimorphos, successfully altered the asteroid's orbit. This marks humanity's first time purposely changing the motion of a celestial object and the first full-scale demonstration of asteroid deflection technology. Images such as the below helped scientists understand the orbit change resulting from DART's impact.



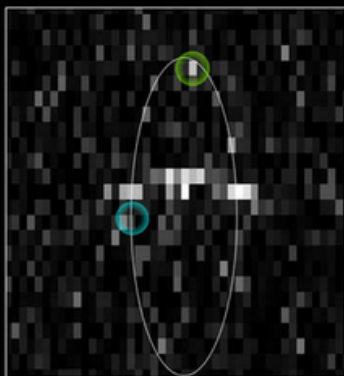
ASD's LICIACube satellite acquired this image just before its closest approach to the Dimorphos asteroid, after the Double Asteroid Redirect Test, or DART mission, purposefully made impact on Sept. 26, 2022. Didymos, Dimorphos, and the plume coming off of Dimorphos after DART impact are clearly visible.
Credits: ASI/NASA



Dimorphos
HST WFC3/UVIS
F350LP

This imagery from NASA's Hubble Space Telescope from Oct. 8, 2022, shows the debris blasted from the surface of Dimorphos 295 hours after the asteroid was intentionally impacted by NASA's DART spacecraft on Sept. 26. The shape of that tail has changed over time. Scientists are continuing to study this material and how it moves in space, in order to better understand the asteroid.
Credits: NASA/ESA/STScI/Hubble

Radar images detect Didymos and Dimorphos



2022 Oct 04 11:55:39 UTC



2022 Oct 09 10:56:47 UTC

- Dimorphos
- Expected Dimorphos from previous 11 hr. 55 min. orbit
- Dimorphos orbit

The green circle shows the location of the Dimorphos asteroid, which orbits the larger asteroid, Didymos, seen here as the bright line across the middle of the images. The blue circle shows where Dimorphos would have been had its orbit not changed due to NASA's DART mission purposefully impacting the smaller asteroid on Sept. 26, 2022. The images show the Didymos and Dimorphos binary asteroid system obtained from radar facilities at NASA Jet Propulsion Laboratory's Goldstone planetary radar in California and the National Science Foundation's Green Bank Observatory in West Virginia. Shown at left are Oct. 4, 2022, observations from Goldstone observations; at right are combined Goldstone and Green Bank observations from Oct. 9, 2022.
Credits: NASA/Johns Hopkins APL/JPL/NASA JPL, Goldstone Planetary Radar/National Science Foundation's Green Bank Observatory

<https://www.nasa.gov/feature/dart-small-satellite-companion-tests-camera-prior-to-dimorphos-impact>

Skymaps.com—Feel free to download the full article directly each month.

The Evening Sky Map

FREE* EACH MONTH FOR YOU TO EXPLORE, LEARN & ENJOY THE NIGHT SKY

NORTHERN HEMISPHERE OCTOBER 2022

SKY MAP SHOWS HOW THE NIGHT SKY LOOKS

EARLY OCT 8 PM
LATE OCT 7 PM

SKY MAP DRAWN FOR A LATITUDE OF 40° NORTH AND IS SUITABLE FOR LATITUDES UP TO 15° NORTH OR SOUTH OF THIS

Get Sky Calendar on Twitter <http://twitter.com/skymaps>

Sky Calendar - October 2022

- 3 First Quarter Moon at 0:14 UT.
- 4 Moon at perigee (closest to Earth) at 16:41 UT (distance 369,325km; angular size 32.4').
- 5 Moon near Saturn at 19h UT (evening sky). Mag. 0.5.
- 8 Moon near Jupiter at 21h UT (evening sky). Mag. -2.9.
- 8 Mercury at greatest elongation west at 21h UT (18° from Sun, morning sky). Mag. -0.5.
- 9 Full Moon at 20:54 UT.
- 12 Moon near Uranus at 7h UT (morning sky). Occultation visible from NW USA, Alaska, Canada and Greenland. Mag. 5.7.
- 13 Moon near the Pleiades at 7h UT (morning sky).
- 14 Moon near Aldebaran at 0h UT (morning sky).
- 15 Moon near Mars at 4h UT (morning sky). Mag. -0.9.
- 17 Moon at apogee (farthest from Earth) at 10h UT (distance 404,328km; angular size 29.6').
- 17 Last Quarter Moon at 17:15 UT.
- 18 Moon near Beehive cluster M44 at 21h UT (morning sky).
- 20 Moon near Regulus at 18h UT (morning sky).
- 21 Orionid meteor shower peaks at 10h UT. Arises from the debris field of Comet Halley. Active from October 2 to November 7. Produces very fast (67 km/sec), generally faint meteors (20 per hour). Radiant located near Orion's club asterism.
- 22 Venus at superior conjunction with the Sun at 21h UT (not visible). Venus is passing into the evening sky.
- 25 New Moon at 10:47 UT. Start of lunation 1235.
- 25 Partial Eclipse of the Sun at 11:00 UT (greatest). Visible from Europe, NE Africa, Middle East and west Asia. Begins 8:58 UT. Ends 13:02 UT.
- 28 Moon near Antares at 5h UT (evening sky).
- 29 Moon at perigee (closest to Earth) at 14:27 UT (distance 368,291km; angular size 32.4').
- 30 Moon at southernmost declination (-27.5°) at 1h UT.

More sky events and links at <http://Skymaps.com/skycalendar/>
All times in Universal Time (UT). (USA Eastern Daylight Time = UT - 4 hours.)

SAVE ON RECOMMENDED PRODUCTS • <http://Skymaps.com/store>

- STAR ATLASSES & PLANISPHERES
- STAR CHARTS & ASTRO POSTERS
- BOOKS FOR SKY WATCHERS
- TELESCOPES & BINOCULARS

All sales support the production and free distribution of The Evening Sky Map.

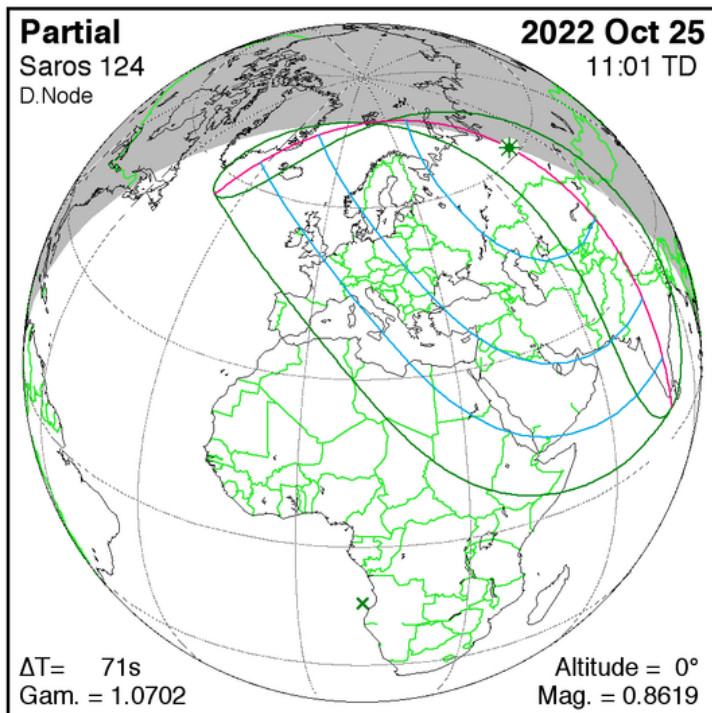
Symbols

- Galaxy
- Double Star
- Variable Star
- Diffuse Nebula
- Planetary Nebula
- Open Star Cluster
- Globular Star Cluster

Star Magnitudes

Copyright © 2000-2022 Kym Thalassoudis. All Rights Reserved.
* TERMS OF USE: FREE FOR NON-COMMERCIAL EDUCATIONAL USE. ASTRONOMY EDUCATION GROUPS MAY FREELY DISTRIBUTE PRINTED HANDOUTS. FULL DETAILS AT <http://Skymaps.com/terms.html>

www.EclipseWise.com/eclipse.html



Thousand Year Canon of Solar Eclipses
©2014 by Fred Espenak

Partial Solar Eclipse

25 October 2022
Information for
Weymouth/Portland

Latitude: 50.5877° N
Longitude: 2.4165° W
Time Zone: UT1 GMT/London

Partial Solar Eclipse
Magnitude: 0.214
Obscuration: 0.115

Event	Contact	Date	Time	Alt	Azi
Partial Eclipse Begins	C1	2022/10/25	09:10:32.3	17.9°	137.8°
		2022/10/25	09:57:00.4	22.3°	149.0°
Partial Eclipse Ends	C4	2022/10/25	10:44:59.7	25.5°	161.3°

Predictions by F. Espenak, www.EclipseWise.com