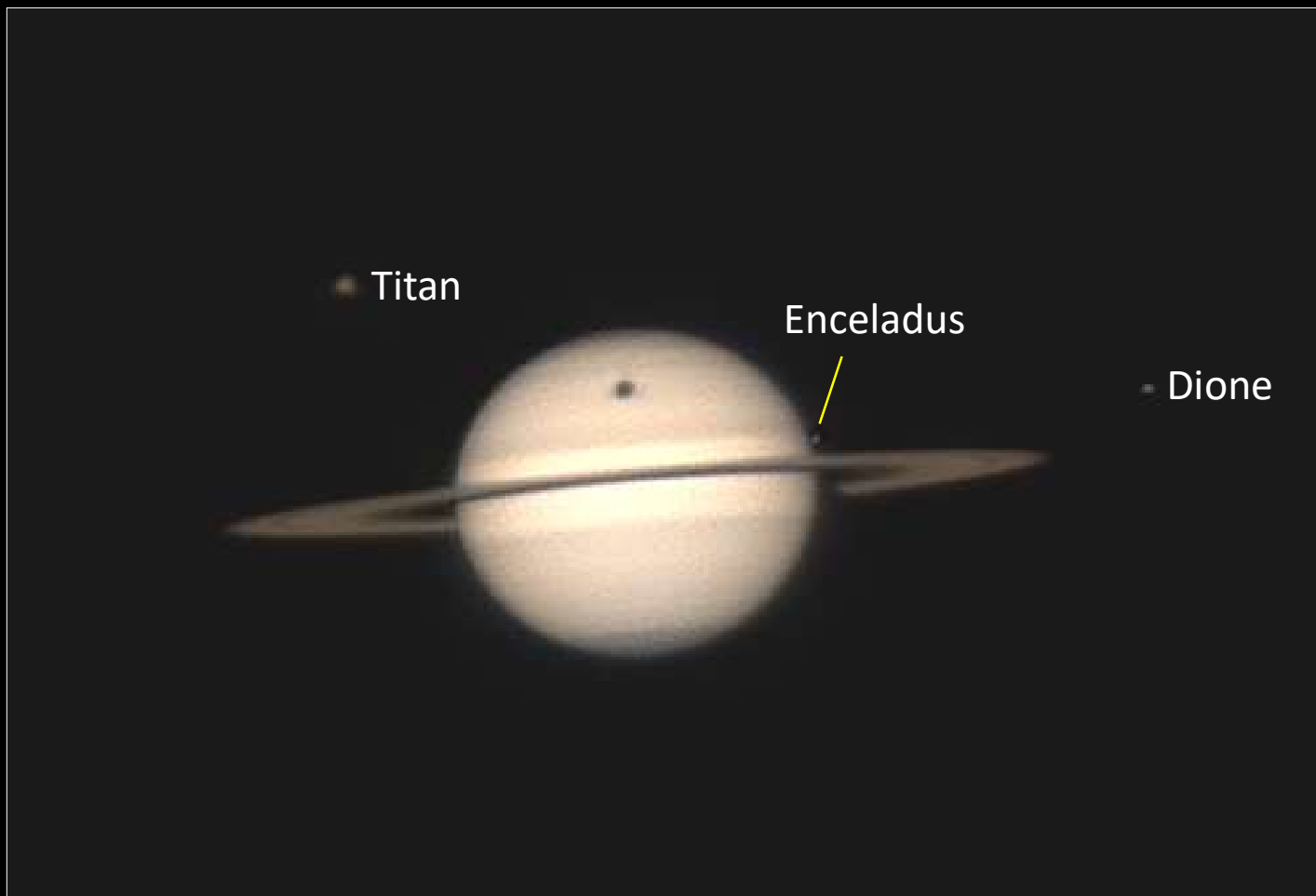


# John J. McCarthy Observatory

September 2025 Newsburst



Saturn's rotational axis is tilted at  $26.7^\circ$  relative to its orbital plane (similar to Earth). Responsible for the planet's seasons, the tilt also changes our view of the ringed planet over its 29.4-year orbit. Approximately every 15 years the Earth passes through the plane of Saturn's rings ("ring-plane crossings"). At this time, from our perspective, the rings appear nearly edge-on, with their icy brilliance greatly diminished. Ring-plane crossings provide an opportunity for astronomers to study Saturn's subdued shadowy planetary features and smaller moons that are otherwise lost in the reflected light of the rings.

The orbits of Saturn's major moons, including Titan, travel within the ring plane and during these times appear to cross Saturn's disk. While moon transits occur on a regular basis, the transit of their shadows upon the cloud deck is less frequent.

The image (above) of Titan's shadow crossing the disk of Saturn was captured in the early morning of August 3<sup>rd</sup>. Similar events will occur on September 4<sup>th</sup> and 20<sup>th</sup>, and on October 6<sup>th</sup>. After that, it will be another 15 years before we will have another opportunity to witness Titan's shadow play on Saturn's clouds.

Photo: Marc Polansky

# The McCarthy Observatory is a 2025 Shoemaker NEO Grant Recipient



The Planetary Society recently announced the winners of its 2025 Shoemaker Near-Earth Object (NEO) Grant program. Named after the pioneering planetary geologist Gene Shoemaker, the grants are intended to support very advanced amateur astronomers around the world in their efforts to find, track, and characterize near-Earth asteroids.

Grants were awarded to ten astronomers/astronomical organizations in eight different countries. Monty Robson and the McCarthy Observatory was one of two recipients of a grant in North America. The money will help fund the design and construction of an automated, remotely controlled facility on the grounds of the current observatory. This auxiliary facility will be dedicated to NEO research observations, reducing the demand on the main facility and allowing for greater use by the public.

During the last lunar month, the McCarthy Observatory was ranked 21st in the world by the European Space Agency's Near Earth Objects - Dynamic Site, among observatories, both professional and amateur, participating in asteroid confirmation work. The award of the Shoemaker grant is further affirmation of the extraordinary performance and contribution to the science of planetary defense by this all-volunteer local organization.



# Milky Way Galaxy Season



*Bill Cloutier*

The Milky Way Galaxy seen rising off the coast of Maine on a moonless night. The galaxy appears at an angle, in part, due to our solar system being inclined approximately  $60^\circ$  relative to the galactic disk. The photo was captured from the shore of Mt. Desert Island.

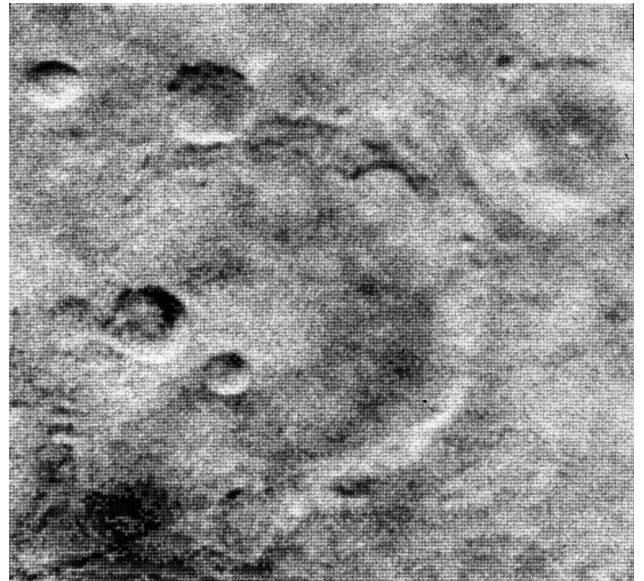
Photo: Bill Cloutier



## Mariner 4 Anniversary

The Mariner 4 mission was the first successful mission to the planet Mars. Launched in December 1964, one month after the failure of its twin, Mariner 3, when the payload shroud did not deploy, Mariner 4 captured 21 black and white images of the planet's surface starting at approximately 40 minutes prior to close approach and at a range of 6,118 miles (9,846 kilometers).

The first close-up images of another planet showed a heavily cratered and bleak surface. While dashing hopes of finding a planet teeming with life, Mariner 4 was still a pathfinder, opening up an era of exploration and astrobiology missions that is still ongoing 60 years later.



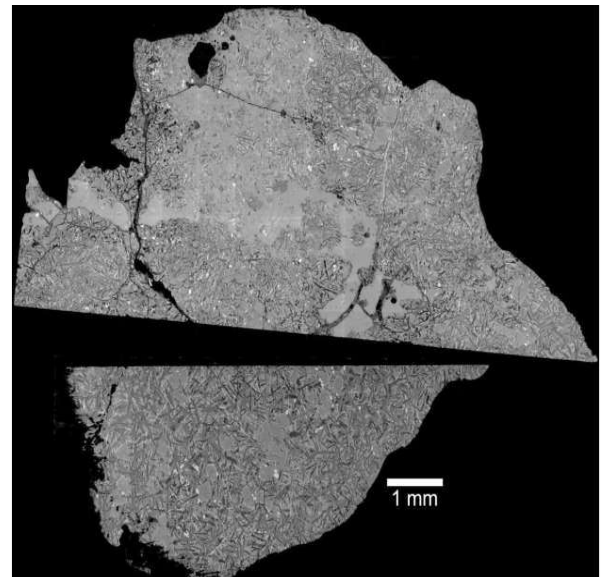
A 94-mile (151 km) diameter crater, named Mariner crater, captured from a distance of 7,800 miles (12,600 km)

Image Credit: NASA/JPL

## Missing Piece to Lunar History of Volcanism

Analysis of the lunar meteorite Northwest Africa 16286 has allowed researchers to fill a gap in the history of volcanism on the Moon. A lead isotope analysis dated the meteorite's formation to around 2.35 billion years ago, and a chemical assay to an ancient lava flow as its origin. The crystallization age is older than the 2 billion year old samples returned by China's Chang'e 5 mission, but younger than those returned by the Apollo astronauts (which were dated between 3.1 and 3.9 billion years).

Lunar volcanism, and its history, provide scientists insights into the changes ongoing in the Moon's interior over time and clues as to the source of the heating, such as radioactive decay, that drove the long-lived eruptions.

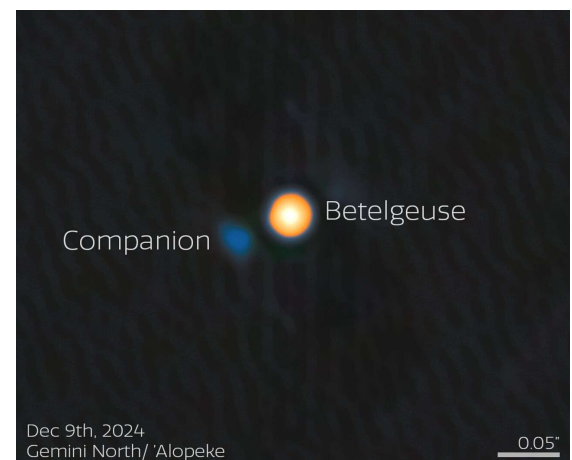


Images from a scanning electron microscope that highlight the variations in the chemical composition of the different minerals in the rock.

Credit: University of Manchester

## Betelgeuse Companion

Astronomers had long suspected that Betelgeuse might have a companion, based upon a periodic change in its brightness, but until recently, any opportunity to view the companion had been lost in the glare of the red supergiant. However, based on more than 100 years of observations to predict the widest separation of the two stars, astronomers at the Gemini North telescope were able to detect the companion with a speckle image technique. Using very short exposure times to minimize the distortion produced by Earth's atmosphere, combined with the light gathering power of the telescope's 8.1 meter mirror, a young, hot blue-white companion, with an estimated mass of around 1.5 times that of the Sun, was detected in an orbit very near the visible edge of Betelgeuse.



Credit: International Gemini Observatory/NOIRLab/NSF/AURA

Image Processing: M. Zamani (NSF NOIRLab)



# Artificial Solar Eclipses



The solar corona captured in the visible light spectrum  
Credit: ESA/Proba-3/ASPIICS/WOW algorithm

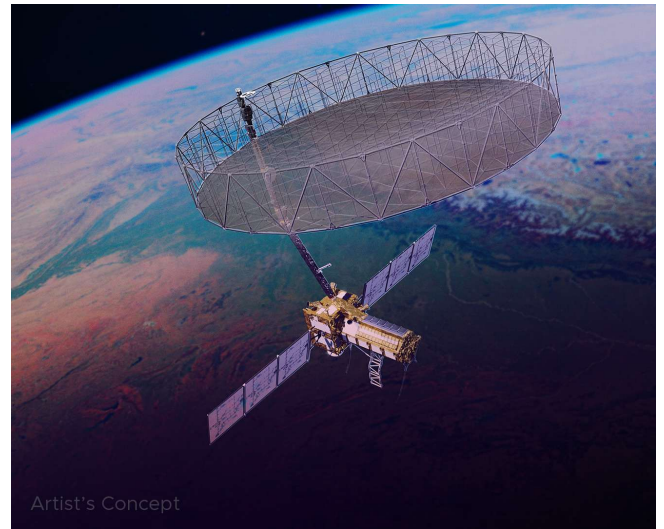
When the European Space Agency launched their Proba-3 mission last December, the goal was to fly the two spacecraft, positioned just 490 feet (150 meters) apart, with such precision that one spacecraft would cast a controlled shadow on the other – creating a long-lasting artificial solar eclipse. This will allow scientists to study the Sun's outer atmosphere (the corona) for up to six hours during each orbit (compared to just minutes during a natural solar eclipse).

The two spacecraft need to maintain their relative position to millimeter accuracy so that a 55 inch (1.4 meter) disc on the lead (Occulter) spacecraft covers the Sun's bright photosphere and casts a shadow of just 3 inches (8 cm) on the ASPIICS instrument on the Coronagraph spacecraft.

During the commissioning phase, the orbiting pair have generated 10 successful solar eclipses, with the longest lasting five hours.

## Innovative Technology

The NISAR (NASA-ISRO Synthetic Aperture Radar) spacecraft was launched on July 30th. Deployment of its large antenna reflector, spanning 39 feet (12 meters), took almost a week with a choreographed sequence employing motors, cables and explosive bolts. The joint project combines two synthetic aperture radar systems (a first): an L-band system, provided by NASA's Jet Propulsion Laboratory that can see through clouds and forest canopy, and an S-band system provided by the Indian ISRO Space Applications Centre that is more sensitive to light vegetation and moisture in snow. The radars will scan nearly all the planet's land and ice surfaces twice every 12 days, tracking the movement of ice sheets and glaciers, alterations in the land due to earthquakes, volcanoes, and landslides, and changes to forests and wetland ecosystems to great precision and resolution.



Artist Rendering of NISAR  
Credit: NASA/JPL-Caltech

## Psyche's Home Planet Photo

The Psyche spacecraft won't reach the metal-rich asteroid of the same name for another 4 years, but the mission team has been busy troubleshooting an issue with the propulsion system, as well as checking out the spacecraft's science instruments including the magnetometer and the gamma-ray and the neutron spectrometer. On July 20 and July 23, the team used the Earth and Moon as targets to calibrate its twin cameras.

Earlier this year the science team had imaged Jupiter and Mars through different filters as they build a library of objects with familiar spectra for use when they arrive at the Psyche asteroid in 2029.



Earth and Moon from about 180 million miles (290 million km)  
Credit: NASA/JPL-Caltech/ASU

## Europa Clipper Mars Encounter

NASA's Europa Clipper team took advantage of a close encounter with Mars to test the spacecraft's infrared camera. Scientists hope to use the camera to detect areas on Jupiter's moon where water may have welled up in the past through near-surface fractures creating regions that are warmer than the surrounding ice.

The infrared image of the heat radiating from Mars and its moons Phobos (closest to Mars) and Deimos (upper left corner) was captured as the Europa Clipper approached the Red Planet at a distance of 560,000 miles (900,000 km). At closest approach, the spacecraft passed just 550 miles (884 kilometers) above the surface of Mars.

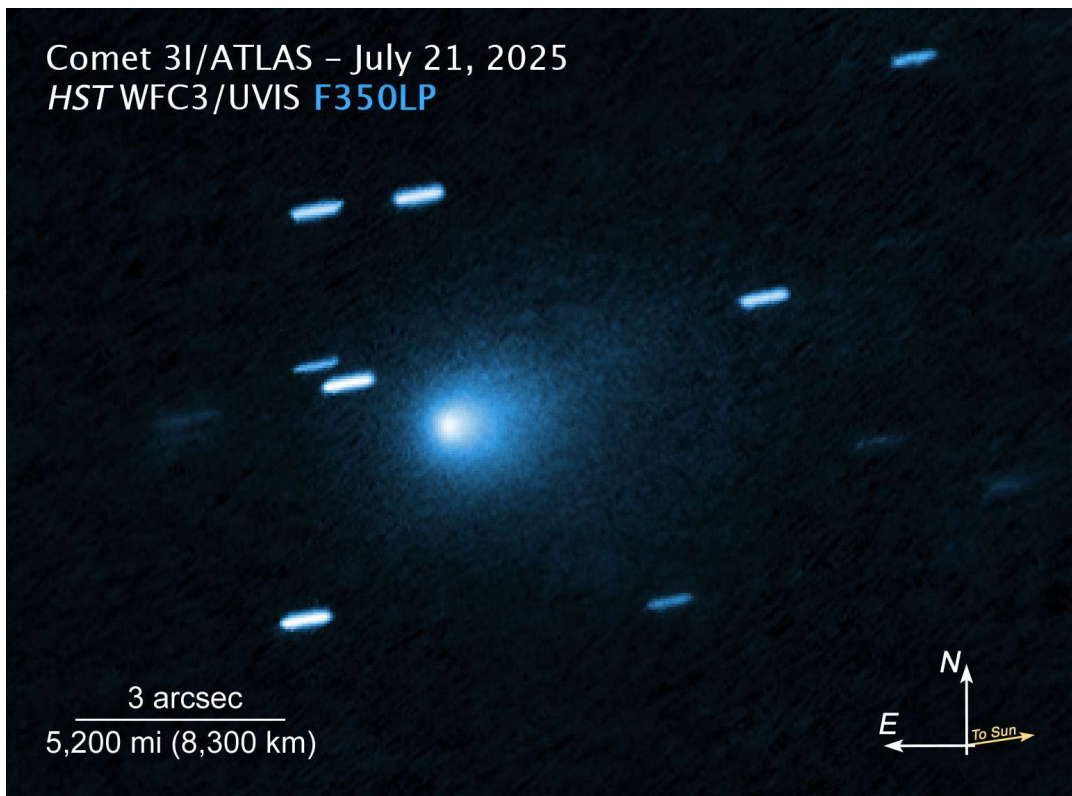


The heat radiating from the northern polar cap (at  $-190^{\circ}\text{F}$  /  $-125^{\circ}\text{C}$ ), is considerably less and therefore darker than the rest of the planet.

Credit: NASA / JPL-Caltech / ASU / SwRI



# Interstellar Visitor



The visible light image of the interstellar comet 3I/ATLAS was captured by the Hubble Space Telescope's Wide Field Camera on July 21, 2025 at a distance of 277 million miles (446 million km) from Earth. The image shows an icy nucleus surrounded by a bright cloud of gas and dust (coma).

Credit: NASA, ESA, David Jewitt (UCLA); Image Processing: Joseph DePasquale (STScI)



Comet 3I/ATLAS as viewed from the McCarthy Observatory as it passed through the constellation Scorpius on August 18<sup>th</sup> at a distance of 245 million miles (394 million km).

Credit: Marc Polansky



# Webb Third Anniversary



**NASA released a near-infrared image of a portion of the Cat's Paw Nebula (NGC 6334) for the third anniversary of the James Webb Space Telescope. The active star-forming region is immersed within an interstellar cloud of gas and dust.**

**Located approximately 4,000 light-years away in the constellation Scorpius, intense ultraviolet radiation and stellar winds from young stars are carving hollows within the nebula, while producing a bright glow of the surrounding interstellar medium.**

**Credits: NASA, ESA, CSA, STScI.**



## China's Moon Lander

China has put its new lunar lander through a series of engineering tests as it evaluates the performance of the vehicle with simulated landings and takeoffs. The four-legged lander, named Lanyue ("Embracing the Moon"), is designed to carry a crew of two, along with supplies and scientific equipment, from lunar orbit down to the surface for multi-day stays.

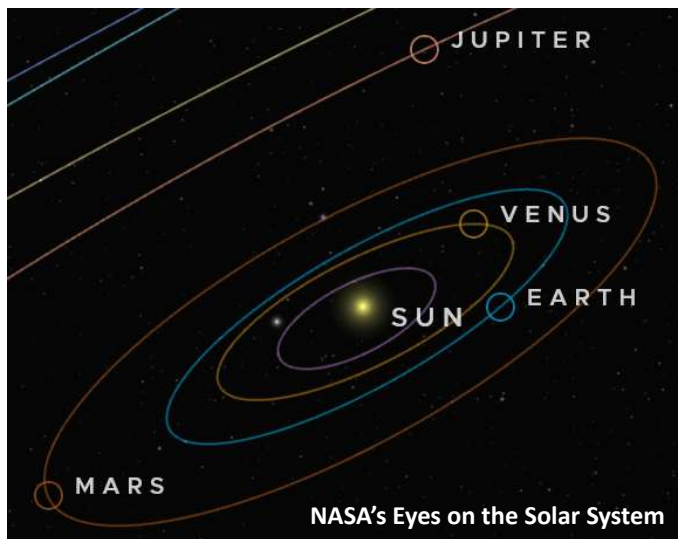
The tests, which were successful, are critical to China's plans to land astronauts on the Moon by 2030 and establish a research station, along with its international partners, by 2035.



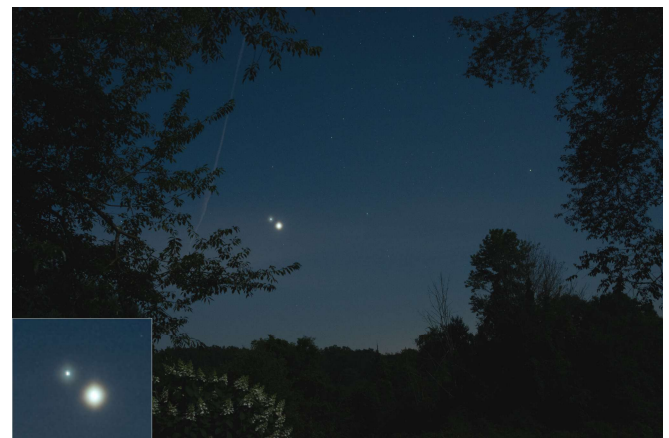
China's new lunar lander, "Lanyue," undergoing testing

Image Credit: CCTV

## A Dazzling Dawn Alignment



While Jupiter was more than 485 million miles (782 million km) further from Earth than Venus on the morning of August 12<sup>th</sup>, the two planets appeared in close proximity to one another, as viewed from Earth, due to the orbital alignment shown above.



A striking morning conjunction of Jupiter (upper left) and Venus in the morning twilight

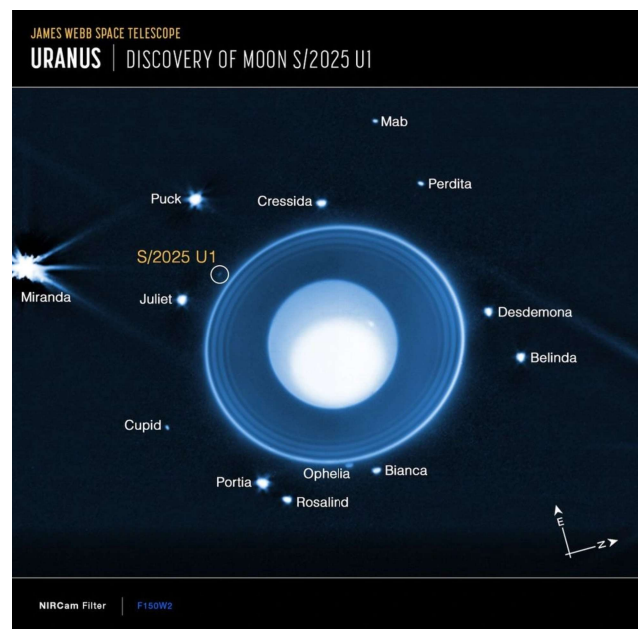
Photo: Bill Cloutier

## Another Moon for Uranus

Researchers combing through images of Uranus taken by the James Webb Space Telescope's Near-Infrared Camera (NIRCAM) found a small moon that had eluded prior detection. The planet's 29th moon, provisionally designated as S/2025 U1, has a mean diameter of 6 miles (10 km) - one of the smallest known moons of the seventh planet. S/2025 U1 orbits Uranus once every 9.6 hours, and is located between the moons Bianca and Ophelia.

JWST's view of Uranus and its moons, including S/2025 U1

Credit: NASA / STScI / ESA / M. El Moutamid (SWRI) / M. Hedman (University of Idaho)





# Apollo-Soyuz



Astronaut Deke Slayton and Cosmonaut Aleksey Leonov in Soyuz Orbital Module

Credit: NASA

Fifty years ago, two superpowers ended a decade-long space race with a handshake in orbit. The joint U.S.-USSR Apollo-Soyuz Test Project culminated with three Apollo astronauts meeting up with two Soviet cosmonauts 138 miles (222 km) above the surface of the Earth. The Apollo capsule and Soviet spacecraft would remain attached for almost two days while the crews conducted joint activities and experiments.

The first crewed international space mission was promoted as a compatibility test of rendezvous and docking systems in the event that a space rescue was ever needed, but the political ramifications of two rivals working together in space laid the groundwork for future joint missions, as well as the partnership to construct the International Space Station.

The Apollo capsule was crewed by astronauts Tom Stafford, Commander, Vance Brand, Command Module Pilot, and Deke Slayton, Docking Module Pilot. Commander Aleksey Leonov and Engineer Valeriy Kubasov crewed the Soviet Soyuz spacecraft.







**FREE EVENT**

*John J. McCarthy Observatory*  
Behind the New Milford High School  
860.946.0312

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

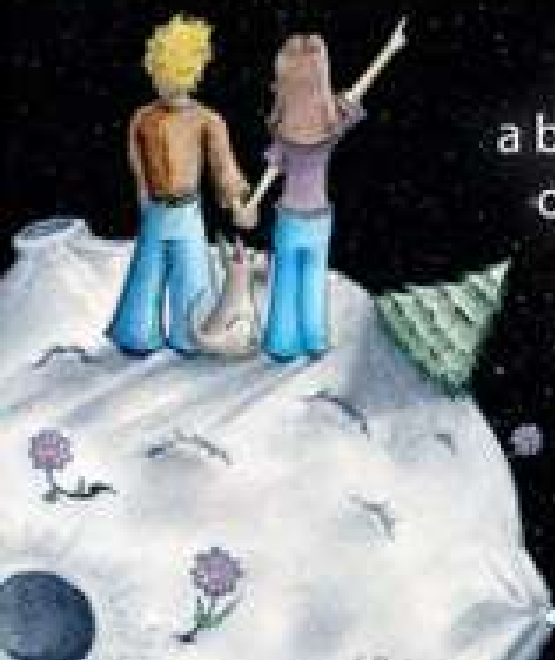
**September 13<sup>th</sup>**

**8:00 - 10:00 pm**

# Free Star Party

Featuring:

## Human Colonization of Mars








All are welcome to enjoy  
a brief presentation along with  
observing\* the sights of the  
night sky through  
a variety of telescopes!

\*Observing if weather permits



# Contact Information



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