



ASTRO

NEWSLETTER

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Hayabusa2 is an asteroid sample-return mission operated by the Japanese space agency, JAXA.

near-Earth asteroid 162173 Ryugu



MASCOT mission accomplished at Ryugu

The lander has successfully touched down on the surface of the asteroid, exploring its rocky landscape.

In yet another historic feat, Hayabusa2's MASCOT rover has completed its mission to explore, probe and photograph the surface of asteroid Ryugu. The rover spent three asteroid-days, or 17 Earth-hours, hopping across the asteroid and conducting research with an array of high-powered instruments. Before its battery life ran out, MASCOT successfully transmitted the first-of-its-kind data to Hayabusa2. Once it's sent back to Earth, scientists will use the stats to track the asteroid's journey through space and decode the elements that made up our ancient solar system. Still to come is another rover scheduled for next summer and Hayabusa2's long-awaited "punch" into the asteroid to gather up samples for a return to Earth. On October 3, Hayabusa2 descended from 12 miles (20 kilometers) above Ryugu, the zone where it's hung out since it arrived in June, to drop MASCOT off about 200 feet (60 meters) above the asteroid. The tiny box-shaped rover, which measures less than a foot in diameter and weighs just 22 pounds (10 kilograms), didn't have the steadiest landing, though. As early as the end of October, the mothership (Hayabusa2) will make its first attempt at shooting a projectile into the asteroid and collecting samples to bring back to Earth. It should give researchers unprecedented insights into the pristine surface of an asteroid and may tell us about conditions at the very beginning of our solar system.

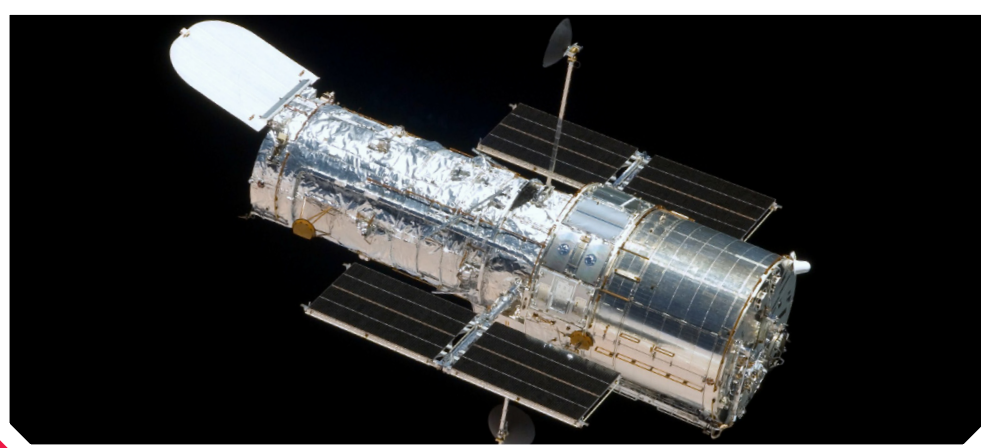
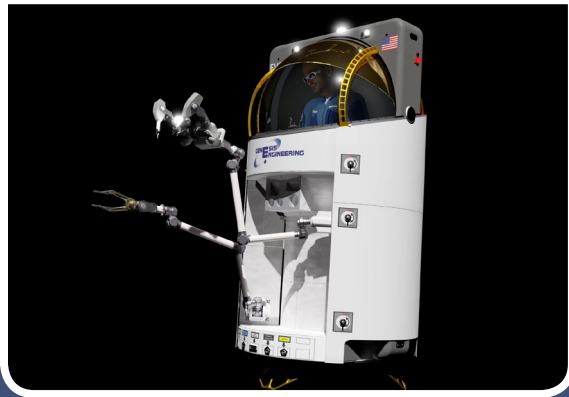


New Space Junk Removal System

Space junk is a growing problem, and with the private space industry racing to make tourism in Low Earth Orbit (LEO) it will only become more pressing. The European Space Agency estimated in 2017 that there were 19,894 pieces of space junk circling the Earth, coming to a combined weight of at least 8,135 tonnes. An international research project from Japan and Australia offers a new potential solution: an ion beam shepherd (IBS), a still-hypothetical contactless approach originally designed for asteroid deflection.

With a satellite shooting out a plasma beam and multiple propulsion systems keeping it in place, the system could hypothetically move large asteroids. And now, say scientists, it could be used to clear out space junk orbiting the Earth. Instead of shoving an asteroid to the side, it would push debris towards the Earth's atmosphere, letting it burn up harmlessly. popularmechanics.com

astronomy.com



Innovative Single-Person Spacecraft Design Passes Leak Test

A spacecraft designed to eventually replace many spacewalking astronaut activities passed two key pressure tests in September, representatives from the company building the spacecraft told Space.com in an exclusive interview.

The spacecraft concept from Maryland-based Genesis Engineering Solutions is just big enough for one person; an astronaut would float inside the spacecraft for several hours and use robotic arms to manipulate equipment. Propulsive thrusters would allow the spacecraft to nestle close to a target, similar to NASA's Manned Maneuvering Unit jetpack that was briefly tested on astronaut spacesuits in the 1980s. Instead of using a bulky spacesuit to do repairs on NASA's future Lunar Orbital Platform-Gateway space station, for example, the Genesis spacecraft operator could use the robotic arms while remaining in relative comfort inside of an enclosed cockpit.

One of them is ensuring that the spacecraft can hold pressure. Genesis engineers performed the tests in early September at the facility of their manufacturing partner, AMRO Fabricating Corp., in the greater Los Angeles area (South El Monte). AMRO is also manufacturing panels for NASA's and Lockheed Martin's human-rated Orion spacecraft, which is supposed to bring astronauts to the moon in the 2020s.

The first Genesis spacecraft test showed that the crew cabin could hold pressure even when subjected to 1.5 times the expected operating pressure. The second test showed that the spacecraft had minimal leaks from its joints; eventually, the goal is to have no leaks at all.

space.com

Hubble in Safe Mode After Gyro Failure

NASA's venerable Hubble Space Telescope is in safe mode after the failure of one of its gyros and a problem with another, but the agency said this specific problem did not put the orbiting observatory in jeopardy.

In a statement Oct. 8, NASA said the spacecraft went into a protective safe mode around 5 p.m. Eastern Oct. 5 after one of three gyros actively being used to orient the spacecraft malfunctioned. The safe mode means science observations with the spacecraft are interrupted while operators deal with the problem.

Hubble is equipped with six gyros to precisely point the spacecraft, which were replaced in the final shuttle servicing mission in 2009. Two others have previously failed, most recently in April. All three are of a similar design, and NASA said it was not surprised that this third gyro failed.

"The gyro that failed had been exhibiting end-of-life behavior for approximately a year, and its failure was not unexpected," the agency said in its statement. "The remaining three gyros available for use are technically enhanced and therefore expected to have significantly longer operational lives."

However, one of those three "technically enhanced" gyros is experiencing problems of its own. That gyro, which had been powered down, is not "performing at the level required for operations," according to spacecraft telemetry after it was

commanded to turn on. That issue is keeping the spacecraft from resuming normal operations using three gyros.

NASA has convened an anomaly review board to investigate the issue with the enhanced gyro. "If the outcome of this investigation results in recovery of the malfunctioning gyro, Hubble will resume science operations in its standard three-gyro configuration," the agency stated.

Should engineers conclude that the enhanced gyro can't be used, leaving only two, controllers plan to shift to an alternative mode that allows the spacecraft to operate with just a single gyro. That would permit one of the two gyros to be turned off, preserving its life until it's needed when the other fails. While NASA says that reduced-gyro mode would have "relatively limited impact on the overall scientific capabilities," some astronomers are concerned that the reduced-gyro mode could adversely affect some types of observations, such as of solar system objects, that require the precision of three-gyro operations.

NASA didn't disclose an anticipated schedule for resolving the gyro issue and resuming operations, either with one or three gyros. The current problem, though, is a reminder that, with the retirement of the shuttle, NASA currently lacks a means to repair or upgrade Hubble. Thus, each problem brings the telescope, one of the most famous and productive observatories in the history of astronomy, one step closer to its eventual end.

spacenews.com



First SpaceX mission with astronauts set for June 2019: NASA

NASA has announced the first crewed flight by a SpaceX rocket to the International Space Station (ISS) is expected to take place in June 2019.

It will be the first manned US launch to the orbiting research laboratory since the space shuttle program was retired in 2011, forcing US astronauts to hitch costly rides aboard Russian Soyuz spacecraft. A flight on Boeing spacecraft is set to follow in August 2019.

The timetable for both launches has already been postponed several times, but NASA said Thursday it would now be providing monthly updates on deadlines.

Both missions are considered tests: the two astronauts transported in each flight will spend two weeks aboard the orbiting ISS before returning to Earth.

In the long term, NASA will use SpaceX and Boeing to take astronauts to the ISS for regular missions, which last about six months. SpaceX will carry out an uncrewed test in January 2019, and Boeing in March 2019. SpaceX will use its Falcon 9 rocket for its launch with a Crew Dragon capsule attached on top.

Boeing's Starliner ship will be propelled into space by an Atlas V rocket made by the United Launch Alliance, a joint venture with Lockheed Martin.

NASA is depending on the success of both missions as its contract with the Russian space agency expires in November 2019.

phys.org

Meet Proxima Centauri, closest star to Sun

The star Proxima Centauri, one of 3 stars in the Alpha Centauri system, is our sun's nearest known neighbor at 4.2 light-years away.

The star Proxima Centauri isn't visible to the eye, but it's one of the most noted stars in Earth's sky. That's because it is considered to be part of the Alpha Centauri star system, a triple system, and the nearest star system to our sun. Of the three stars in Alpha Centauri, Proxima is thought to be the one actually closest to our sun, at 4.22 light-years away. The image above – from the Hubble Space Telescope – is one of the best we've seen at showing Proxima clearly.

If it's so nearby, why can't we see Proxima Centauri with the eye? It's because Proxima is so small. It's a red dwarf star with only about an eighth of the mass of the sun. Faint red Proxima Centauri – at only 3,100 degrees K (5,120 F) and 500 times less bright than our sun – is nearly a fifth of a light-year from Alpha Centauri A and B.

This great distance from the two primary stars in the system is what calls into question its status as part of a triple star system.

On the other hand, although Proxima is far from Alpha Centauri A and B,

it is not very far from us. And thus – over time – we can see its motion through space.

In 2016, the European Southern Observatory announced the discovery of Proxima b, a planet orbiting Proxima Centauri at a distance of roughly 7.5 million km (4.7 million miles) with an orbital period of approximately 11.2 Earth days. Its estimated mass is at least 1.3 times that of the Earth.

The equilibrium temperature of Proxima b is estimated to be within the range of where water could exist as liquid on its surface, thus placing it within the habitable zone of Proxima Centauri. But a 2017 study suggests that the exoplanet does not have an Earth-like atmosphere.

That may indicate that radiation from its star would drain an Earth-like atmosphere 10,000 times faster than on Earth, although because Proxima Centauri is a red dwarf and a flare star, whether it could support life is disputed. Previous searches for orbiting companions had ruled out the presence of brown dwarfs and supermassive planets.

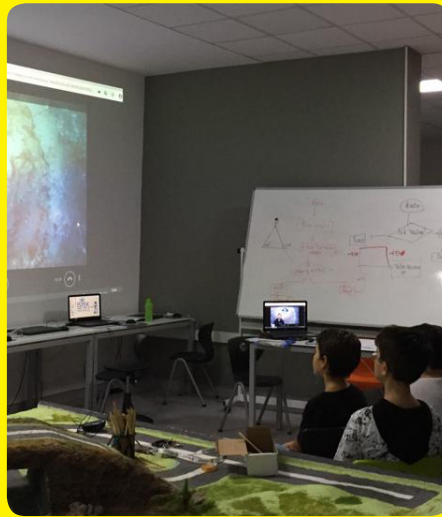
Bottom line: Proxima Centauri, one of three stars in the Alpha Centauri system, is the nearest star to our sun. It's 4.22 light-years away.

earthsky.org

FEP is Started!

Hello Everyone;

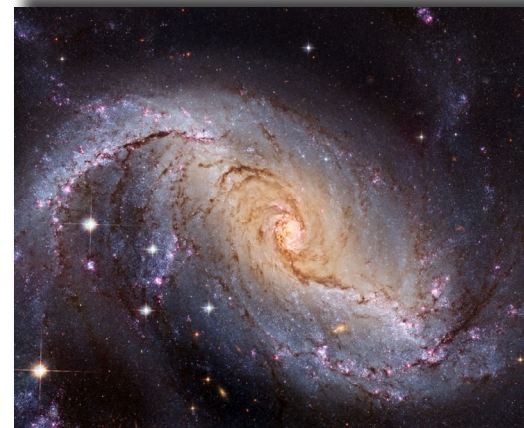
Most of the schools participating in our programs have started working on their Mission Patches and they are doing their best to complete them before the deadline. After their presentations they will start focusing on creating new space toys or modifying the existing toys so that they work in microgravity. The photos on the right side belong to Izmir Mavişehir ISTEK School students. They took notes during the first presentation and now they started creating their mission patches in their own unique way. We will share with you the end results in the next issue!



Astronomy Picture of the Day

NGC 1672: Barred Spiral Galaxy from Hubble

Many spiral galaxies have bars across their centers. Even our own Milky Way Galaxy is thought to have a modest central bar. Prominently barred spiral galaxy NGC 1672, featured here, was captured in spectacular detail in an image taken by the orbiting Hubble Space Telescope. Visible are dark filamentary dust lanes, young clusters of bright blue stars, red emission nebulas of glowing hydrogen gas, a long bright bar of stars across the center, and a bright active nucleus that likely houses a supermassive black hole. Light takes about 60 million years to reach us from NGC 1672, which spans about 75,000 light years across. NGC 1672, which appears toward the constellation of the Dolphinfish (Dorado), is being studied to find out how a spiral bar contributes to star formation in a galaxy's central regions.



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