

Science Focus

HAWKING'S FINAL THEORY

How strange, new discoveries could finally prove we live in a hologram



IN THIS ISSUE

The quest to
save our soils

Gut health secrets
that slow ageing

The AI colony where
humans are banned

How to spot harmful
processed foods

The top-6 space missions to watch out for after Artemis II

Artemis II might be making all the headlines, but it's not the only major mission set to launch in 2026

by EZZY PEARSON



I

t's an exciting time to be a space fan!

If Artemis II launches in March (having been pushed back from a February launch due to fuelling issues), humans will be going back

to the Moon for the first time since Apollo 17 in 1972. The goal of the mission isn't to land on the lunar surface, but to take its crew of four on a figure-of-eight flightpath around our nearest celestial neighbour and return them safely.

Its success will pave the way for Artemis III, which should make a lunar landing and see the first woman set foot on the Moon. Artemis III won't launch until 2027, but you won't have to wait until then to get your next fix of space-exploration excitement.

There's a whole host of missions launching between now and then, from a new super space telescope to a daring mission to Mars. After Artemis II, these are six of the most exciting missions set to blast off in 2026.

1

CHANG'E 7

Artemis II isn't the only mission heading to the Moon this year. In August, the China National Space Administration is expected to send its latest lander, Chang'e 7, to the lunar surface.

It's bound for the lunar south pole, a region that's gained a lot of interest in recent years after signs of water ice were found in the permanently shadowed corners of deep craters there.

This ice has remained untouched for billions of years and could answer key questions about what the Solar System looked like when it was younger, as well as being a potential resource for future lunar explorers.

The plan is for Chang'e 7 to land on the rim of Shackleton Crater, right next to the lunar south pole. There, it will deploy its small solar-powered rover, which will work with the main lander to search the surrounding area for signs of water.

The most daring part of the mission, however, is its small flying probe. This will

ABOVE An illustration of the Martian Moons eXploration (MMX) mission in orbit around Mars

ABOVE RIGHT A model of the Chang'e-6 lunar probe, Chang'e-7's predecessor, displayed at the Wenchang Aerospace Science and Education Center

JAXA, SHUTTERSTOCK



take short flights into the crater's shadows, and use its molecular analyser to sniff out the potential presence of water.

Such a spacecraft has never been tested on the Moon before (NASA used a flying probe called Ingenuity on Mars in 2024, but China's will fly using mini rocket thrusters instead of rotors). If it works, it could give clues to other treasures that might be hiding in the lunar shadows.

2 NANCY GRACE ROMAN TELESCOPE

Another superstar space observatory will join Hubble and the JWST this year, as NASA's Nancy Grace Roman Space Telescope is set to launch sometime after September.

In many ways, the telescope is very similar to Hubble – it has the same 2.4m-wide (7.9ft) mirror, the same resolution and both are about the size of a bus. What sets Roman apart, however, is that it views an area of sky 100 times larger.

“Such a spacecraft has never been tested on the Moon before”

This allows Roman's infrared cameras to cover vast areas of the sky with remarkable speed, and most of its five-year primary mission will be dedicated to three different sky surveys.

The first will look towards the centre of the Milky Way, seeking out stars, black holes and even distant planets.

The other two surveys will look out to the wider Universe. One aims to cover 12 per cent of the whole sky, investigating how the cosmos is laid out and how it's expanding.



Meanwhile, the last survey will focus on a much smaller area – around the size of 90 full Moons – but will re-examine it every five days. This should hopefully reveal transient events, such as supernovae or stars being devoured by black holes.

3 PLATO

Over the last three decades, astronomers have confirmed the discovery of over 6,000 planets beyond our Solar System. What nobody has found among all those 'exoplanets', however, is a planet like Earth, because we haven't had observatories capable of finding them.

The European Space Agency's PLATO (Planetary Transits and Oscillations of Stars) spacecraft, due to launch towards the end of 2026, will change that. Using 26 cameras working together, PLATO will scan the skies looking for the tiny dips in a star's brightness created when a planet passes in front of it.

PLATO will be powerful enough to pick up small, rocky planets in orbit around stars like our Sun. Critically, it will be able to find exoplanets orbiting in the habitable zone – the region around a star where liquid water can pool on the surface.

Here on Earth, water is a critical ingredient for the formation of life. While there's no guarantee there will be alien life on any of these worlds, PLATO will give us a good idea of where to start looking.



4 MARTIAN MOONS EXPLORATION

In November 2026, the Japanese Aerospace Exploration Agency, JAXA, will launch a mission aiming to achieve something no one has attempted before – landing on one of Mars’s moons. Even more astoundingly, they’re planning on bringing a piece of it back.

Mars has two tiny moons, Phobos and Deimos, but planetary scientists are uncertain how they came to be. Are they asteroids that were captured by Mars’s gravity? Or were they chipped off from the main planet during a huge meteor impact?

The Martian Moons eXploration (MMX) mission aims to answer that question for the larger of the two moons, 27km-wide (17 miles) Phobos. The spacecraft is due to enter orbit around Phobos in 2027, where it will spend three years examining the moon in detail. During that time, it’ll land, scoop up a piece of the surface and return it to Earth in 2031.

This would be the first time a sample has ever been returned from the Mars system, but it could be the last we see for a while. NASA’s Perseverance rover has been collecting rocks on the planet’s surface since 2021, in the hope of returning them to Earth. But the US Congress cut all funding for the sample return project in January, effectively cancelling the mission.

ABOVE ESA’s HERA mission will deploy shoebox-sized CubeSats to observe and analyse the asteroid Dimorphos



by **EZZY PEARSON**

Ezzy is a commissioning editor for BBC Science Focus.

5 HERA

66 million years ago, a giant asteroid struck Earth, wiping out most life on the planet. It could happen again, but fortunately we have space programmes now, meaning we have the potential to deflect the path of a killer asteroid before it sends us the same way as the dinosaurs.

In 2022, NASA proved we could knock an asteroid off course when the DART mission (Double Asteroid Redirection Test) crashed into the asteroid Dimorphos, changing its orbit around its larger partner asteroid Didymos by 32 minutes.

In November 2026, the European Space Agency’s (ESA) follow-up mission, Hera, will arrive at the asteroid to survey the damage.

The spacecraft will inspect Dimorphos, paying particular attention to the crash site. It’ll also deploy two smaller CubeSats, which will determine what the asteroid is made of and map its internal structure.

The aim is to find out as much as possible about the asteroid and how the DART impact affected it. Should a space rock ever be found on a collision course with Earth, the data from Hera would help mission planners know where and how hard to hit it in order to knock the rock onto a trajectory away from our planet, as well as predict where it might go afterwards.

6 BEPICOLOMBO

Of all the rocky planets in the Solar System, Mercury is the most overlooked. Only two missions have ever taken a close look at it, but that number is set to double on 21 November 2026, when BepiColombo arrives at the world closest to the Sun after an eight-year journey.

That’s because the mission is a double whammy and, shortly after arriving, the cruising craft will split into two separate science orbiters.

The Mercury Planet Orbiter, built by ESA, will map out the planet’s surface and interior, and study its exosphere – the tenuous ‘atmosphere’ created by gases emitted from the rocks on its surface or captured from space.

Meanwhile, JAXA’s Mercury Magnetospheric Orbiter will examine the planet’s magnetic field and see how the Sun’s closest neighbour reacts to being bombarded by the solar wind.

The goal is to gain a better understanding not just of our Solar System, but of the thousands of known exoplanets that orbit close to their stars. By studying Sun-hugging Mercury up close, ESA hopes to better understand how such tight orbits might affect these distant worlds and their atmospheres.