**‘JUICE’ mission to Jupiter**

The Jupiter Icy moons Explorer launched, expected to arrive in 2031.

The JUICE mission launched on the 14th of April, 2023, one day late because of a lightning storm, by European Space Agency from Europe's Spaceport in French Guiana, and launcher Ariane 5. It will travel to Jupiter, but not directly. To gather speed, it will make 3 planetary flybys. First, it will complete the Lunar-Earth gravity assist for the first time, using the gravity of the moon and Earth at the same time, gaining speed. It will fly to Venus, then back to Earth, each time using the gravity and orbit of the planet to gain speed without using as much fuel. It will then fly to Jupiter’s biggest moon, Ganymede, to ease into Jupiter’s orbit in 2031.

JUICE will study in detail Jupiter and three of its biggest moons, Ganymede, Callisto, and Europa, which all have icy surfaces. Jupiter and its moons are like a mini solar system, so understanding them will help scientists better understand the solar system as whole. The study will help scientists better understand the conditions for planet formation.

While they are not looking for life, the mission will help scientists answer the question of ‘is there life elsewhere?’ A main goal is to understand whether there are habitable environments on the icy moons around a giant planet like Jupiter. The study will help scientists better understand the conditions for the emergence of life.

JUICE will be the first spacecraft to orbit any moon other than ours. The moon it will orbit, Ganymede, is the biggest moon in our solar system, as well as the only moon in our solar system to have a magnetic field. The mission will help uncover much important information in science.

<https://www.esa.int/Science_Exploration/Space_Science/Juice>

[https://www.9news.com.au/world/european-spacecraft-on-way-to-jupiter-and-its-icy-moons/cefefd39-512d-47d1-800a-d6fba9ebddab](https://www.9news.com.au/world/european-spacecraft-on-way-to-jupiter-and-its-icy-moons/cefefd39-512d-47d1-800a-d6fba9ebddab#:~:text=A%20European%20spacecraft%20rocketed%20away,the%20coast%20of%20South%20America.)

<https://arstechnica.com/science/2023/04/europe-is-about-to-launch-one-of-its-most-ambitious-missions-ever/>

<https://sci.esa.int/web/juice/>

<https://www.esa.int/Science_Exploration/Space_Science/Juice_factsheet>

[https://solarsystem.nasa.gov/missions/juice/in-depth/](https://solarsystem.nasa.gov/missions/juice/in-depth/#:~:text=JUICE%20(JUpiter%20ICy%20moons%20Explorer,2022)

<https://www.space.com/europe-launches-juice-mission-jupiter-ocean-moons>

<https://www.space.com/europe-juice-jupiter-mission-lauch-april-13-highlights>

**Record-breaking woman back in space!**

Peggy Whitson has gone back to space after almost 5 years, at age 63.

Peggy was born on the 9th of February 1960. She graduated from Rice University with a doctorate in biochemistry. She got her first job at NASA in 1988, working in different NASA research positions based at the Johnson Space Centre.

She was chosen to be an astronaut in 1996, but only went to space in 2002. She was a flight engineer on *Endeavor,* docking with the ISS on the 7th of June, two days after the shuttle blasted away from Earth. While in space, she became the first NASA ISS Science Officer, and completing a spacewalk. On her next spaceflight in 2007, she became the first female commander of the International Space Station. In 2008, while returning from her trip to space, she crashed 470km away from the target. Thankfully, she fully recovered. Peggy was the first non-military and first female chief of the Astronaut Office.

When she next flew to space in 2016, she didn’t return until 289 days later, taking the record for longest time in one spaceflight for a woman, a record she kept for three years. While in space, she completed 4 more spacewalks, breaking the record for the most time on a spacewalk total for any woman. She also held the record for most time in space total of any American astronaut, as well as the oldest female astronaut.

When Peggy left NASA in 2018, she expressed her wishes to continue to pursue spaceflight. She said “I am not sure what the future holds for me personally, but I envision myself continuing to work on spaceflight programs. My desire to contribute to the spaceflight team as we move forward in our explanation of space has only increased over the years.” (Garcia, 2017) On the 21st of May 2023, she blasted away from Earth yet again as commander of the Ax-2 mission. This mission was run by a private company called Axiom Space. This marked her as the first female commander of a private space mission.

The mission was flown in SpaceX Falcon 9 rocket and Dragon capsule and launched from NASA’s Kennedy Space Center in Florida. Flying in her crew was two members of Saudi Arabia's first astronaut class, Rayyanah Barnawi and Ali AlQarni, as well as the pilot, John Shoffner.

It took the crew 1 day to travel to the ISS. They stayed there for 8 days, studying how cancer cells are formed in the zero-gravity environment, helping scientists figure out how the cells form not only in space, but on our planet as well. They took a single day trip back to Earth, landing on the 30th of May.

Sources

[www.nasa.gov/astronauts/biographies/peggy-a-whitson](http://www.nasa.gov/astronauts/biographies/peggy-a-whitson)

[www.britannica.comhttps://www.britannica.com/biography/Peggy-Whitson](http://www.britannica.comhttps://www.britannica.com/biography/Peggy-Whitson)

Rice, D. (2018, May 24). Around the world in 665 days: The storied career of astronaut Peggy Whitson. Retrieved from USA Today: <https://www.usatoday.com/story/news/2018/05/24/peggy-whitson-storied-career-americas-most-successful-astronaut/634090002/>

Richardson, D. (2018, June 16). Astronaut Peggy Whitson retires from NASA. Retrieved from Space Flight Insider: <https://spaceflightinsider.com/missions/human-spaceflight/astronaut-peggy-whitson-retires-from-nasa/>

<https://nasa.gov/feature/nasa-astronaut-peggy-whitson-shares-thoughts-on-extended-mission-returning-to-earth>

<https://www.nasa.gov/image-article/ax-2-commander-peggy-whitson-enters-the-space-station/>

<https://www.npr.org/2023/05/22/1177570164/retired-nasa-astronaut-peggy-whitson-returns-to-orbit-with-spacex>

<https://www.space.com/ax-2-astronaut-peggy-whitson-ready-next-flight>

<https://www.axiomspace.com/astronaut/peggy-whitson>

<https://www.space.com/news/live/axiom-space-missions-updates>

**First journey to a metal asteroid**

NASA’s Psyche mission is headed for metallic asteroid 16 Psyche.

It is the first mission to study an asteroid that is made of more metal than rock or ice. It is set to launch on the 13th of October, 2023 from Kennedy Space Centre. However, there is a window everyday at 1:38am AEDT. If it is missed one day, it can launch at this time the following day. The spacecraft used is a SpaceX Falcon Heavy rocket. The metal contained in the asteroid is worth, at current prices, more money than there is on Earth in total.

However, understanding the asteroid could help scientists better understand how our solar system came to be. It will help us understand the iron cores of planets like ours, something we have had trouble learning about in the past. 16 Psyche is suspected by scientists to be the exposed core of a demolished planet, with up to 95% made of iron and nickel by mass, not unlike the core of Earth.

With the data gathered by the Psyche mission, scientist hope to figure out if 16 Psyche is actually a core, or unmelted material, as well as find out what conditions 16 Psyche was formed under compared to Earth’s core.

The Psyche spacecraft is outfitted with a Multispectral Imager, a Gamma Ray and Neutron Spectrometer, Magnetometer, and X-band Gravity Science Investigation, as well as new laser communication technology. These lasers will encode data in photons, or light particles, at near-infrared wavelengths, rather than radio waves, to communicate between a spacecraft deep in space, and us on Earth.

<https://www.abc.net.au/news/science/2023-10-08/nasa-psyche-explainer-asteroid-journey/102885864?utm_campaign=newsweb-article-new-share-null&utm_content=mail&utm_medium=content_shared&utm_source=abc_news_web>

<https://www.jpl.nasa.gov/missions/psyche>

<https://science.nasa.gov/mission/psyche/>

<https://www.space.com/psyche-mission-metal-asteroid.html#tbl-em-lnlidxw027xuzsup0mz>

<https://science.nasa.gov/solar-system/asteroids/16-psyche/>

**A trail of suns**

A black hole racing through the universe, leaving a trail of new stars.

A black hole the mass of 20 000 000 suns

<https://www.abc.net.au/news/2023-04-08/runaway-black-hole-creating-trail-of-new-stars-scientists/102202280?utm_source=abc_news_web&utm_medium=content_shared&utm_campaign=abc_news_web>

<https://science.nasa.gov/missions/hubble/hubble-sees-possible-runaway-black-hole-creating-a-trail-of-stars/>

<https://www.news.com.au/technology/science/space/hubble-space-telescope-accidentally-finds-black-hole-creating-a-trail-of-new-stars/news-story/393c299e1dbd3f36700da3af4169872f>

<https://www.theregister.com/2023/04/09/black_hole_stars/>