

# Galileo tribute plaque unveiled on the Jupiter Icy Moons Explorer, Juice

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A commemorative plaque celebrating Galileo's discovery of Jupiter's moons was unveiled on ESA's Jupiter Icy Moons Explorer, Juice, on 20 January 2023. The spacecraft had just completed its final tests before departing Airbus Toulouse, France for Europe's Spaceport in French Guiana to count down to an April launch. The plaque features imagery of Galileo Galilei's first observations of Jupiter and its moons from a copy of the Sidereus Nuncius hosted in the library of the Astronomical and Copernican Museum, at the headquarters of the Istituto Nazionale di Astrofisica (INAF) in Rome, Italy. The copy is one of the first 550

ever printed in 1610 in Venice. Credit: ESA/M.Pedoussaut

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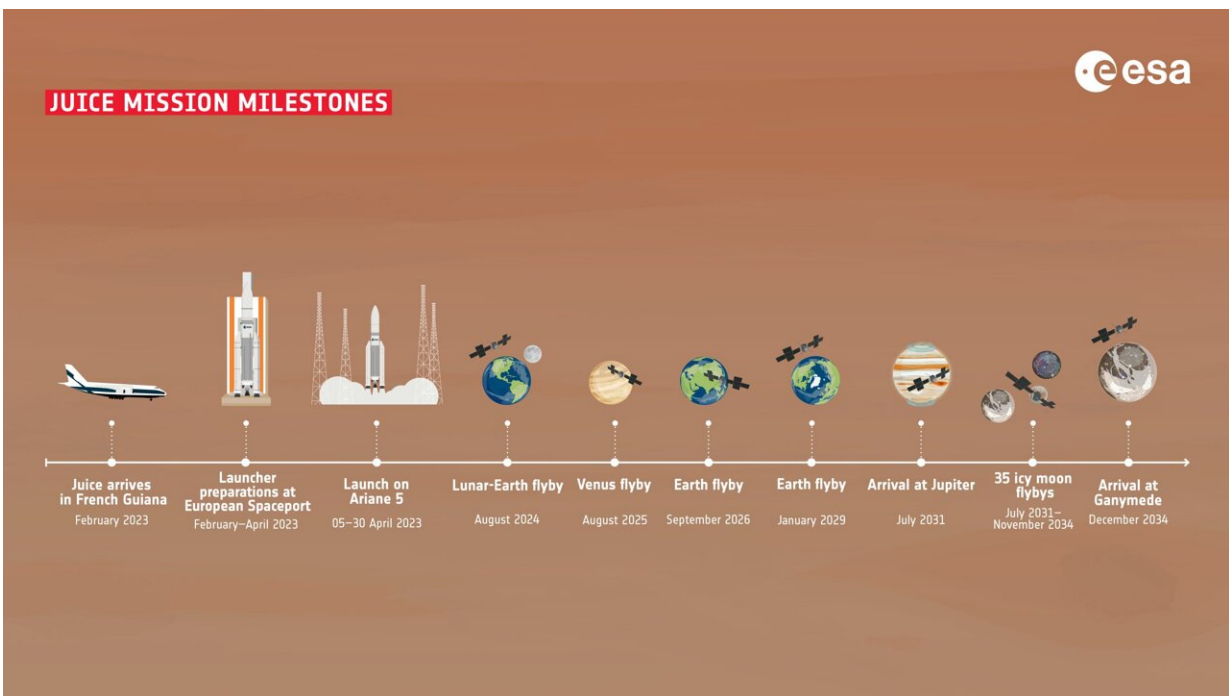
As part of the final preparations a commemorative plaque was mounted on the [spacecraft](#) as a tribute to Italian astronomer Galileo Galilei who was the first to view Jupiter and its four largest moons through a telescope in January 1610. His observation that the moons changed position from night to night overturned the long-held idea that everything in the heavens revolved around Earth. The moons—Io, Europa, Ganymede and Callisto—were to become collectively known as the Galilean satellites in his honor.

The plaque, which replicates several pages of Galileo's *Sidereus Nuncius* where he describes his observations of the moons, was unveiled at Airbus Toulouse on 20 January. Following the event, the spacecraft will be packed for its transatlantic flight to French Guiana where it will be readied for launch on an Ariane 5 from Europe's Spaceport.

"Unveiling the plaque is a beautiful moment in this intense chapter preparing the spacecraft for launch," says Giuseppe Sarri, ESA's Juice project manager. "It's not only an opportunity to pause and reflect on the decades-long hard work that has gone into conceiving, building and testing the spacecraft, but also to celebrate the curiosity and wonder of everyone who's ever gazed up at Jupiter in the night sky and pondered our origins—the inspiration behind this mission."

## Answering humankind's big questions

Three of Jupiter's largest moons—Europa, Ganymede and Callisto—hold vast quantities of water buried under their surfaces in volumes far greater than in Earth's oceans. These planet-sized moons offer us tantalizing hints that conditions for life could exist other than here on our pale blue dot, orbiting [giant planets](#) instead of hot stars. Jupiter and its family of large moons represent an archetype for giant gas planet systems across the universe and as such are some of the most compelling destinations in our solar system.



ESA's Jupiter Icy Moons Explorer (Juice) will make detailed observations of the giant gas planet and its three large ocean-bearing moons—Callisto, Europa and in particular Ganymede. This graphic shows the main mission milestones, from arrival at the launch site in French Guiana in February 2023 to arrival at Ganymede in December 2034. On its journey to Jupiter, Juice will make a series of flybys of Earth, the Earth-Moon system and Venus to set it on course for its

July 2031 rendezvous in the Jovian system. Once Juice has arrived at Jupiter, it will make 35 flybys of the icy moons before going into orbit around Ganymede to make more detailed observations. ESA (acknowledgement: work performed by ATG under contract to ESA), [CC BY-SA 3.0 IGO](#)

ESA and its international partners are almost ready to send Juice on its quest to explore this fascinating planet and intriguing moons. With its suite of powerful instruments, Juice will see Jupiter and its moons in a way that Galileo couldn't even have dreamt of. The data returned by the spacecraft will serve many future generations of scientists determined to uncover the mysteries of the jovian system and its place in the evolution of our solar system.

"With Juice's departure for the launch site fast approaching, we remember its long Earthly journey through various Airbus sites in Europe towards final integration and more than 500 Airbus employees who prepared the spacecraft for its eight-year cruise," says Cyril Cavel, Juice Project Manager at Airbus Defense and Space. "It has been an incredible adventure, along with more than 80 companies across Europe, to bring ESA's vision to life and ultimately study Jupiter and its icy moons in-depth."

## **A trio of milestones**

Three important milestones have been concluded in the last weeks alone. In December the spacecraft completed a final thermal vacuum test needed to confirm it is ready for the harsh temperatures inflicted by the space environment.

Last week a final "System Validation Test" saw the spacecraft—sitting in Toulouse—"plugged in" to mission control at ESA's Space Operations

Center (ESOC) in Darmstadt, Germany, to simulate the first activities after launch when Juice's various arrays, booms and appendages will unfold, with the final version of the flight software

Finally, and most critically, on 18 January the Qualification and Acceptance Review confirmed readiness to move forward with launch preparations at the Spaceport.

Juice will lift off on an Ariane 5 in April—the last ESA mission to fly on this launcher before Ariane 6 takes over.

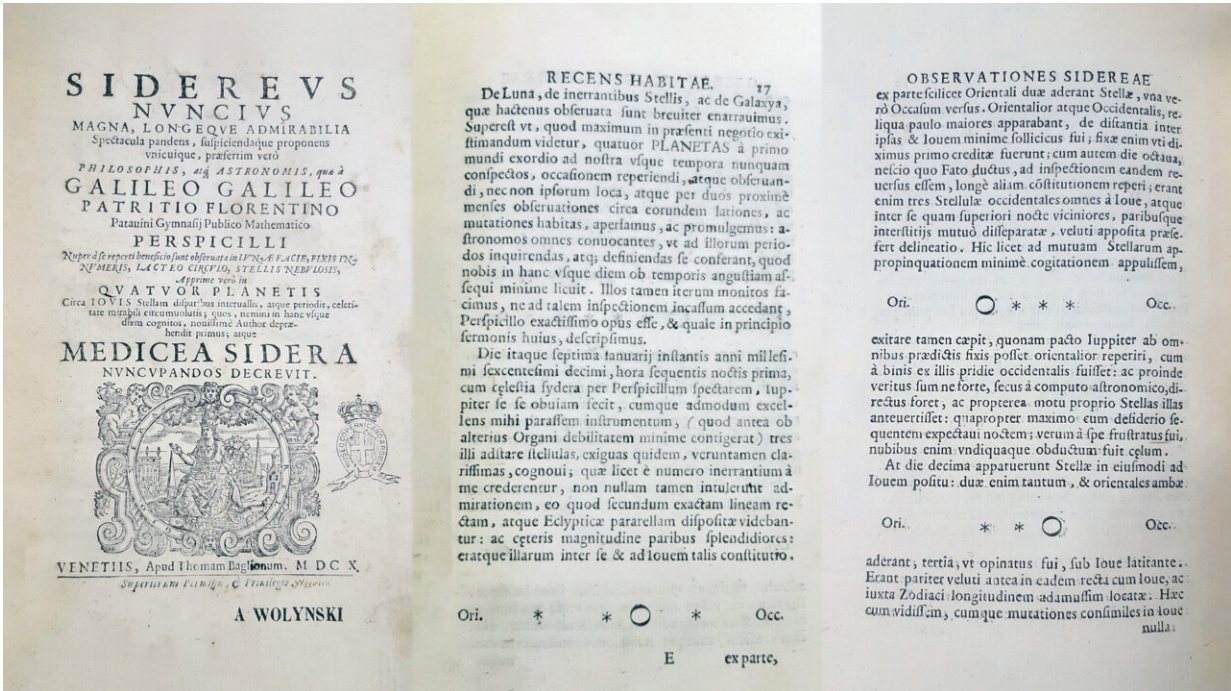
### **Preparing for a treacherous trip**

In parallel, while Juice moves to the Spaceport, a strong focus of activities remains centered at ESA's ESOC [mission control](#) center in Germany. The flight control teams will ramp up their training for launch and early operations in a series of 16 intensive multi-day simulations.

"This is the biggest deep-space mission we've ever launched, and it needs to nimbly orbit the moons of the largest planet in the Solar System using no less than 35 flybys," explains Andrea Accomazzo, Flight Operations Director for the mission.

"Juice's exploration of Jupiter and its moons will require us to perform a decade of operations we've never done before, and a lot could go wrong. In these weeks of simulations, we'll have every possible problem thrown at us, so that we can handle any situation in space."

Following launch, Juice will fly an eight-year course through the Solar System, its path punctuated with gravity assists of Earth and Venus to slingshot it out to Jupiter.



The inspiration behind Juice’s Galileo plaque. Credit: INAF – Istituto Nazionale di Astrofisica

Depending on the exact day it launches—and so depending on the geometry of the Solar System on that day—Juice could perform the first-ever lunar-Earth gravity assist. This would see the mission perform a flyby of the Moon and just a day later a flyby of Earth.

Once it arrives in the Jupiter system Juice will face a harsh radiation and temperature environment, hundreds of millions of kilometers from Earth, in order to gather data that will uncover the mysteries of the planet's complex environment and ocean-bearing moons.

To fly such a complex path from such an enormous distance—and vitally, to get Juice's data home—will require extreme navigation techniques, reliant on ESA's Estrack network of deep space antennas in

Spain, Argentina and Australia, controlled remotely from ESOC.

The spacecraft, ground support equipment and personnel will arrive at the Spaceport early February for the intensive launch site preparations, culminating in launch this April.

Provided by European Space Agency

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