AIRBUS

Backgrounder

JUICE, tracking life on Jupiter and its icy moons

March 2023 - Europe is set to explore our solar system further than it's ever gone before - and Airbus has designed and built the spacecraft that will make it happen. JUICE builds upon the scientific and technological heritage from previous European planetary science missions to Mars, Venus and Mercury and will pave the way for future deep space exploration of the outer Solar System.

Launching in April 2023, Airbus has developed the JUICE (JUpiter ICy moons Explorer) spacecraft for the European Space Agency to study Jupiter and its icy moons.
Signed as prime contractor in 2015, Airbus has led a consortium of more than 80 companies during the course of the project. Airbus' site in Leiden, the Netherlands, was responsible for manufacturing the largest solar arrays ever for an interplanetary mission – covering a total surface area of 85 square metres.

JUICE's journey - from Earth to Jupiter

"It's been a long Earthly journey through various sites towards final integration and flight readiness", says Cyril Cavel, JUICE project manager. "It is truly an international accomplishment, involving companies across Europe and close to 500 team members in Airbus in Spain for the structure, the UK for propellant tanks, Germany for spacecraft assembly and electrical engineering, France for software and spacecraft final testing but also the Netherlands for the solar arrays and Poland for the harness."

Following the shipment from the Airbus production site in Toulouse, France, to Kourou, French Guiana, the JUICE spacecraft will be launched on an Ariane 5 in April 2023.

That is when JUICE will begin a cruise of over 8 years to reach Jupiter and then spend more than 4 years in the Jovian system. After launch, JUICE will use a series of gravitational flybys of the Earth, Venus and Mars to build up enough speed to reach Jupiter's orbit.

JUICE will sweep around the giant planet, exploring its turbulent atmosphere, enormous magnetosphere, and tenuous set of dark rings, as well as exploring the huge planet's three largest icy moons: Europa, Ganymede and Callisto, in the hope of determining whether life is

possible on these dwarf planets. JUICE will analyse this icy Jovian moons nature and evolution, characterising its subsurface ocean, and investigating potential habitability.

State-of-the-art technology

The 6.2 ton spacecraft carries ten state-of-the-art instruments, including cameras, spectrometers, an ice-penetrating radar, an altimeter, radio-science experiments, and sensors to monitor the magnetic fields and charged particles in the Jovian system. To ensure these instruments can carry out their measurements undisturbed, JUICE has been built with an unparalleled level of electro-magnetic cleanliness.

To power all these instruments at Jupiter, 780 million km from the Sun, JUICE will use the biggest solar array system ever flown on a planetary mission. This array has a surface area of 85m² - or just over the size of a badminton court - compared to 64m² for the Rosetta comet-chaser mission and a wingspan of 27m, which is almost as wide as the wingspan of an Airbus A320 aircraft. This record will be outdone by another Airbus-built spacecraft currently in development: Mars Sample Return - Earth Return Orbiter.

The whole trajectory of the spacecraft will be commanded from the ground, and when it gets to Jupiter, the spacecraft will use highly powerful Airbus-developed algorithms to navigate autonomously around the moons.

Exploring Jupiter and its icy moons

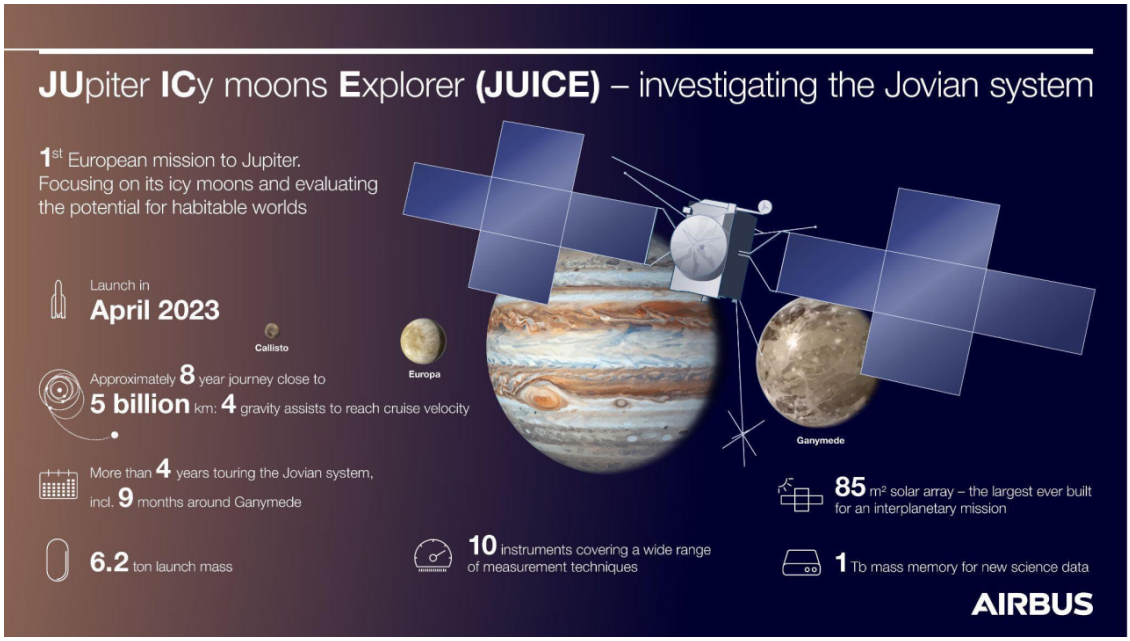
The main goal of the mission is to investigate whether there are liquid oceans under the crust of these icy moons, which might harbour organic components or even life. Once in the vicinity of Jupiter, JUICE will spend over four years gathering data – including nine months orbiting Ganymede, which will mark the first time a spacecraft orbits a moon other than our own. During this period, JUICE will perform detailed investigations of the moon and its interaction with its surroundings.

But JUICE will focus on Jupiter itself as well, gathering data on the gas giant planet's atmosphere, from its cloudy layers to the ionosphere and auroras. The spacecraft's instruments will look at different wavelengths of light to provide new insights into how temperatures, wind patterns and chemistry are changing in this never-seen-before part of Jupiter's atmosphere.

If you can get to Jupiter, you can do anything

The JUICE programme further confirms Airbus' capability to develop, build and support highly complex spacecraft, as already demonstrated with the Orion service module it produced for ESA as Europe's contribution to the U.S.-led Artemis Moon-return programme.

By going even deeper into space with JUICE, Airbus will contribute to the further understanding of our solar system, with this spacecraft's data potentially answering questions on how planets are formed and where life may have emerged.



Contacts for the media

Ralph HEINRICH
Airbus Defence and Space
+49 (0)171 30 49 751
ralph.heinrich@airbus.com

Jeremy CLOSE
Airbus Defence and Space
+44 776 653 6572
jeremy.close@airbus.com