

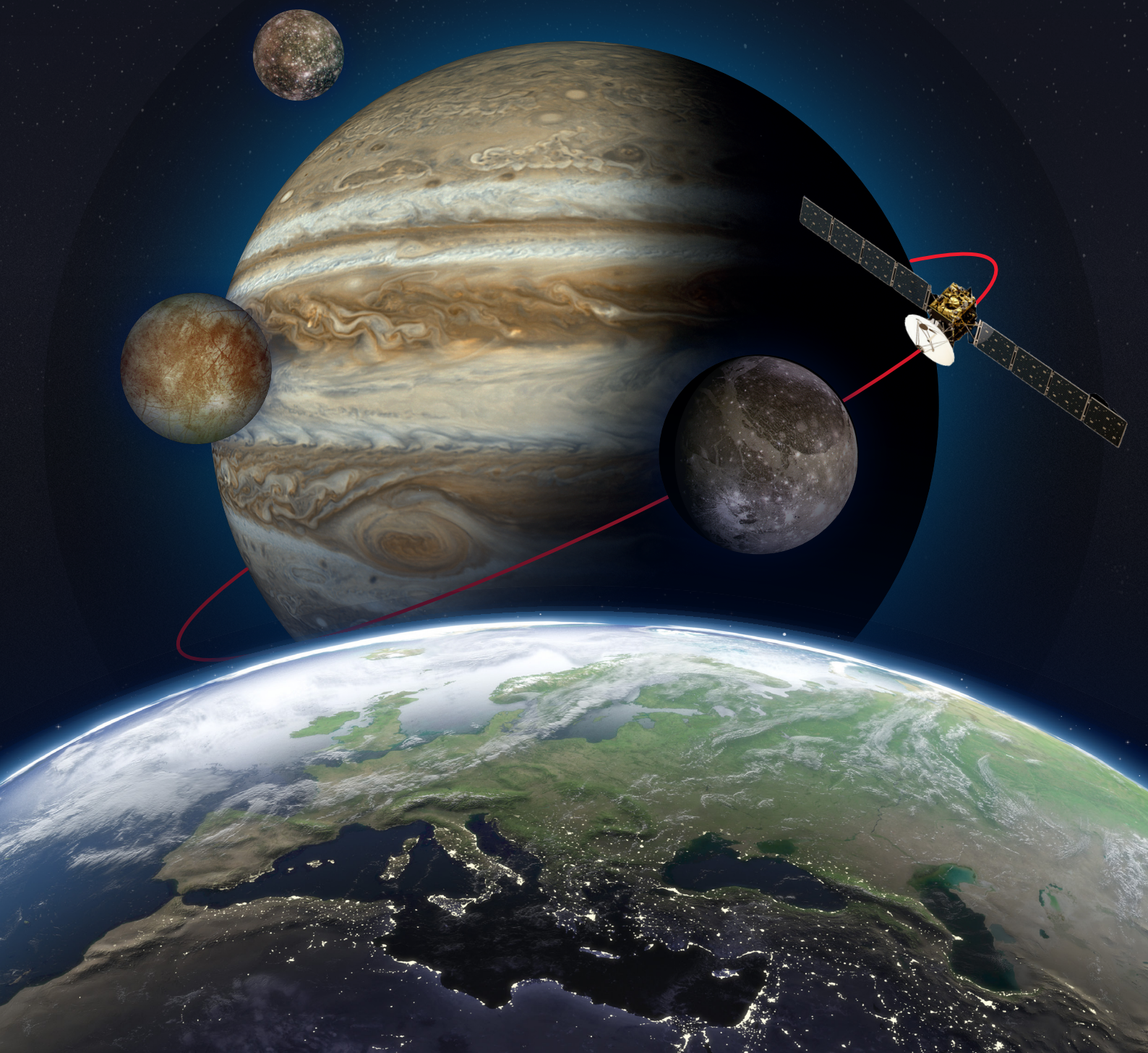


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An OHB Company

COMMUNICATION SUBSYSTEM

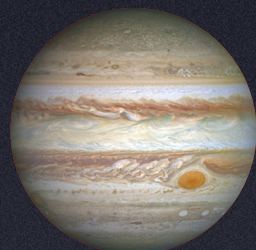
FOR ESA JUICE MISSION



JUICE MISSION

JUICE (JUpter ICy moons Explorer) is the first large-class mission in the European Space Agency's (ESA) Cosmic Vision 2015-2025 programme. The JUICE spacecraft will provide a thorough investigation of the Jovian system in all its complexity with emphasis on three of its largest moons: Ganymede, Europa and Callisto, including their potential habitability. It will be the first spacecraft ever to orbit a moon (Ganymede) of a giant planet.

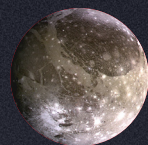
These moons were discovered by Galileo Galilei in 1610 and were the first group of objects found to orbit another planet. They are among the largest objects in the Solar System with the exception of the Sun and the eight planets. Ganymede is the largest moon in the Solar System, and is even bigger than the planet Mercury.



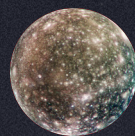
JUPITER



EUROPA



GANYMEDE



CALISTO

TIMELINE

- 2016 KICK-OFF**
Antwerp Space is selected by Airbus for supplying the JUICE communication subsystem
- 2022 LAUNCH**
Launch by a European Ariane rocket followed by a 7,4 year cruise towards Jupiter, based on Earth-Venus-Earth-Mars-Earth gravity assists.
- 2029 FLY-BYS**
After 6 billion km, JUICE will perform several fly-bys of Jupiter, Callisto and Europa over a time span of 2,5 years.
- 2032 IN ORBIT**
The spacecraft will be inserted into a final 500 km circular orbit around Ganymede, where it will remain forever.

COMMUNICATION SUBSYSTEM

Antwerp Space is responsible for designing, integrating and testing the mission-critical communication subsystem.

The scientific instruments on board of the spacecraft will perform local measurements of Jupiter's atmosphere and plasma environment, as well as remote observations of the surface and interior of the three icy moons, Ganymede, Europa and Callisto.

The total generated electrical power of the JUICE spacecraft will be less than 1000 Watt. Furthermore, with a 50 Watt radio-signal power it will generate a daily volume of at least 1.4 Gbyte of scientific data.

Antwerp Space is responsible for designing, integrating and testing the complete communication subsystem, before it is installed onto the JUICE spacecraft. The industrial set-up is based on subcontracting of equipment to European companies, under the supervision of Antwerp Space.

The communication subsystem will enable communications with Earth during the JUICE mission. The large distance of Jupiter to Earth (588 to 968 million km) results in a signal round trip time of up to 1h 48 m, which complicates spacecraft operations. The communication subsystem also incorporates two radio-science experiments from the 3GM Experiment (Gravity and Geophysics of Jupiter and the Galilean Moons): the equipment will

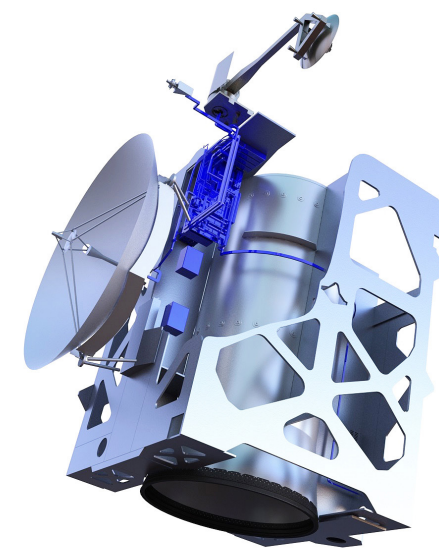
be provided by ESA. High performance is required from the subsystem to ensure precise science measurements.

ESSENTIAL FOR THE MISSION

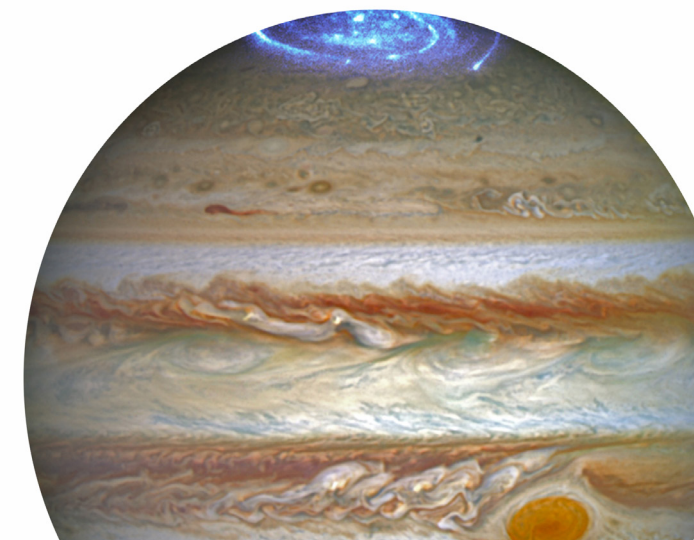
The communication subsystem is the only communication means with Earth; it allows reception of commands from Earth, transmission of Science and satellite status data to Earth, as well as a very accurate measurement of the distance and speed of the satellite.

ROBUSTNESS

The radiation environment encountered by the JUICE spacecraft will be very harsh. In order for sensitive electronics and materials to survive exposure to such an intense radiation environment, special care must be taken in the design: A metal vault encases some of the electronic equipment of the communication subsystem, to ensure it performs to specification throughout the whole mission.



RF POWER (TWTA)	50 watt
MAX DISTANCE TO EARTH	54 light-minutes
MASS SUBSYSTEM	35 kg
MISSION DURATION	10 years



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