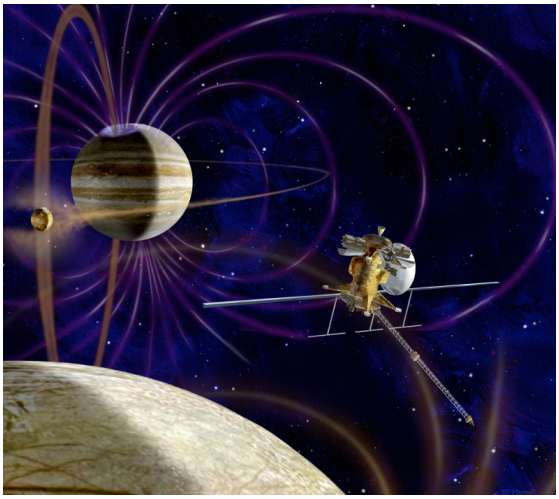
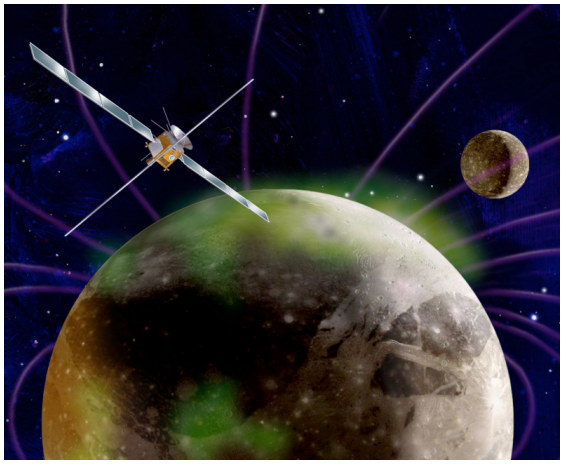
NASA Facts

Europa Jupiter System Mission

The Europa Jupiter System Mission (EJSM) is a joint National Aeronautics and Space Administration (NASA) and European Space Agency (ESA) endeavor currently in formulation devoted to exploring the emergence of habitable worlds around the gas giant planets. The mission focuses on the Galilean moons Europa and Ganymede, but also investigates Io, Callisto, and the Jupiter system as a whole. The NASA-contributed Jupiter Europa Orbiter (JEO) would be launched on a separate launch vehicle from the ESA-contributed Jupiter Ganymede Orbiter (JGO). The orbiters would together enable synergistic science investigations, using their science instruments within the Jupiter system, by searching for the presence and extent of subsurface oceans; characterizing ice shells, subsurface water, and deep internal structure; and comparing exospheres, plasma environments, and magnetospheric interactions. Additionally, the orbiters' instruments would investigate global surface compositions and chemistry and attempt to understand the formation of surface features with the intention of identifying sites for future in situ exploration. The instruments that may potentially be included in the payload to conduct these investigations are laser altimeter; ice-penetrating radar; visible–infrared spectrometer; ultraviolet spectrometer; ion and neutral mass spectrometer; thermal instrument; wide-, medium-, and narrow-angle cameras; magnetometer; plasma and particles instrument; and a submillimeter-wave sounder.



Jupiter Europa Orbiter



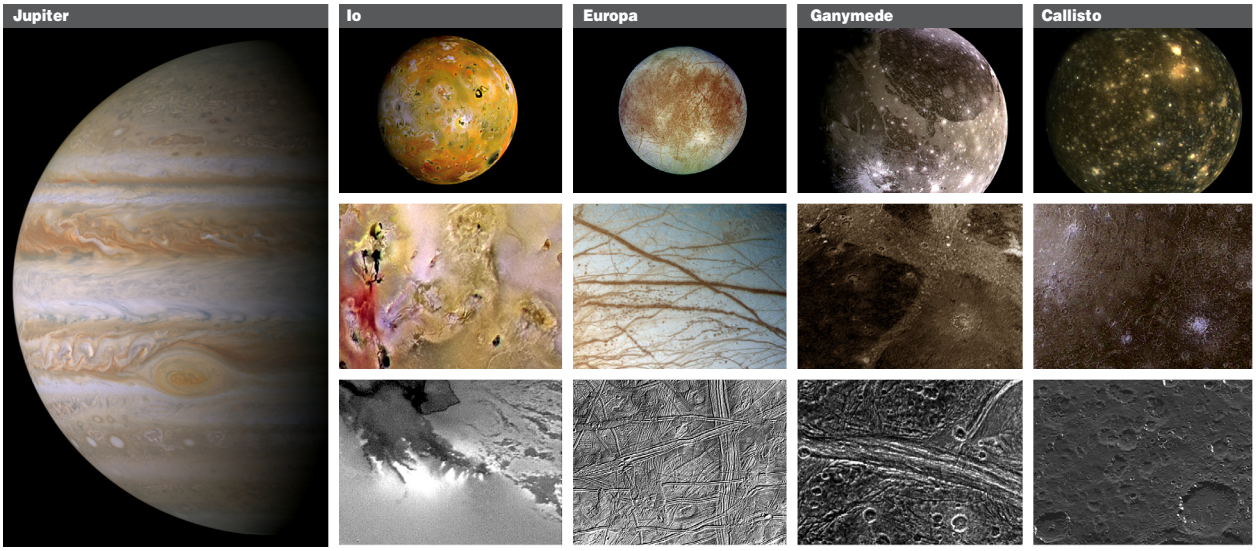
Jupiter Ganymede Orbiter

Event	Jupiter Europa Orbiter (JEO)	Jupiter Ganymede Orbiter (JGO)
Launch (Proposed Dates)	February 2020	March 2020
Jupiter Orbit Insertion	December 2025	February 2026
Satellite Flybys	4 Io, 6 Europa, 6 Ganymede, 9 Callisto	4 Ganymede, 19 Callisto
Europa or Ganymede Orbit Insertion	July 2028	May 2028
End of Mission	March 2029	February 2029
Payload Mass	106 kg	73 kg
Spacecraft Mass (with propellant)	5040 kg	3493 kg

NASA Facts

Galilean Satellites

The Galilean satellites — named for their discoverer, Galileo Galilei — are the four largest bodies orbiting Jupiter to be studied by the Europa Jupiter System Mission. The moons' individual names are derived from the four companions of Zeus (the Greek equivalent of the Roman god Jupiter): Io, Europa, Ganymede, and Callisto. Io, the moon nearest Jupiter, has hundreds of active volcanoes scattered across its surface, making it stand out from its three colder sisters, often referred to as the Icy Moons. Europa, the second closest to Jupiter, has a smooth icy surface indicative of a possible subsurface ocean of liquid water, which is a necessary component to sustain life. Ganymede, the largest of the moons, also is thought to have an ocean beneath its surface. However, unlike Europa's ocean, which is hypothesized to be in direct contact with a rocky core, Ganymede's ocean is likely sandwiched between two layers of ice. Callisto, the farthest large moon from Jupiter, has a heavily cratered surface that is surrounded by an extremely thin atmosphere, believed to be composed of carbon dioxide and oxygen. Together with Jupiter, these four satellites create a miniature solar system wrought with secrets waiting to be discovered.



Characteristic	Io	Europa	Ganymede	Callisto
Average Distance from Jupiter	422,000 km	671,000 km	1,070,000 km	1,883,000 km
Diameter	3,643 km	3,122 km	5,262 km	4,821 km
Mass	8.93×10^{22} kg	4.80×10^{22} kg	1.48×10^{23} kg	1.08×10^{23} kg
Volume	2.53×10^{19} m^3	1.59×10^{19} m^3	7.64×10^{19} m^3	5.88×10^{19} m^3
Gravity	1.8 m/s^2	1.3 m/s^2	1.4 m/s^2	1.2 m/s^2
Mean Temperature	–155 °C	–170 °C	–160 °C	–155 °C
Rotation Period	42.5 hours	85.2 hours	171.7 hours	400.5 hours
Orbital Velocity	17.3 km/s	13.7 km/s	10.9 km/s	8.2 km/s

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For more information, go to:
http://opfm.jpl.nasa.gov/europajupitersystemmissionejsm/