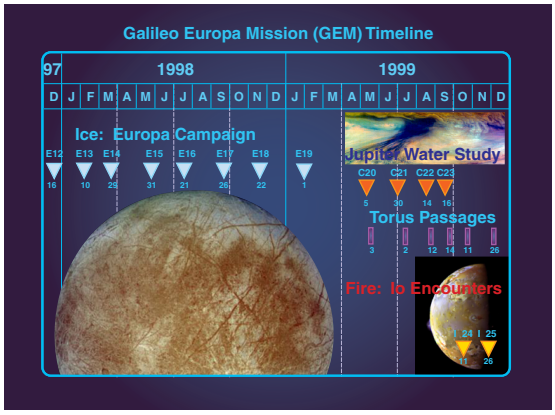
The Galileo Europa Mission - Exploring Through 1999

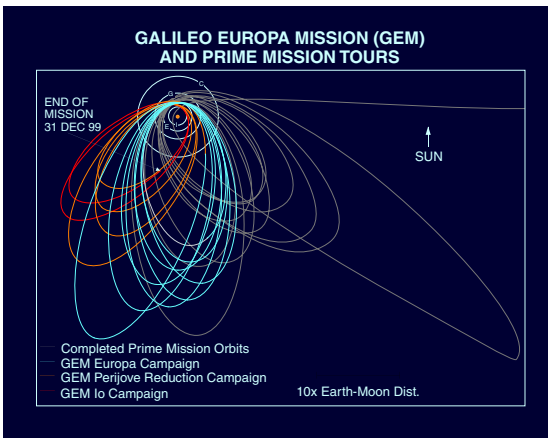
The Galileo Europa Mission is a two-year, 14 orbit, low-cost extension of Galileo's exploration of the Jovian system, with tightly focused objectives in three phases of exploration of Jupiter's "Ice, Water, and Fire":

Ice: Europa Campaign will search for further signs of a past or present ocean beneath Europa's icy surface. GEM data will be compared with previous images for surface changes that may occur, and the surface will be scanned for signs of spewing active ice volcanoes and other direct evidence. Because a flowing, salty sub-surface ocean can generate a magnetic field, scientists will try to determine if the magnetic signals nearest Europa are generated from within. By measuring the pull of Europa's gravity, the thickness of the ice shell and the depth of a possible ocean can be better determined.



Water: Jupiter Water/Io Torus Study focuses on detailed storm and wind patterns in Jupiter's atmosphere, including thunderstorms, and maps the distribution of water (which also helps the understanding of Earth's more fast-paced weather changes). Galileo will map the density of the Io torus, a donut-shaped cloud of charged particles that ring Io's orbit, and use the gravitational pull of Callisto to halve the orbit's perijove (closest distance to Jupiter), in preparation for encountering Io. Scientists will also look at Callisto's magnetic field signatures to search for further evidence of an ocean.

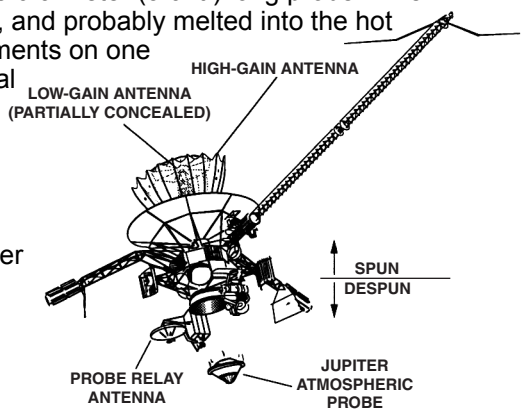
Fire: Io Campaign will obtain high resolution images and a compositional map of Io, and sample a volcanic plume, flying 500 kilometers (310 miles) over the currently active volcano Pillan Patera. Assuming the spacecraft survives the harsh radiation environment, it will pass near the south pole at 300 kilometers (186 miles) to determine if Io has its own magnetic field.



Galileo Europa Mission	***Dec. 8, 1997 - Dec. 31, 1999***
Europa Campaign:	Dec. 16, 1997 - May 4, 1999: 8 orbits E12-E19
Closest approach:	201 km (125 mi) on Dec. 16, 1997 (E12)
Jupiter Water/Io Torus Study:	May 5 - Oct. 10, 1999: 4 orbits C20-C23
Closest approach:	467,000 km (290,000 mi) on Sept. 14, 1999 (C23)
Io Campaign:	Oct. 11 - Dec. 31, 1999: 2 orbits I24-I25
Closest approach:	300 km (186 mi) on Nov. 26, 1999 (I25)
Total Distance Traveled in GEM:	278,300,000 km (172,800,000 mi) (planned)

The Spacecraft

Galileo has two main components, the 6.2-meter (20.3 ft) high orbiter, and the 0.9-meter (3.0 ft.) long probe. The probe descended through an unusually dry spot in Jupiter's top cloudy layers, and probably melted into the hot atmosphere somewhere below the clouds. The orbiter has 6 scientific instruments on one section that spins (3 rpm), for pointing stability and for collecting 3-dimensional fields and particles data near the spacecraft. The "de-spun" section uses gyros to point the 4 remote-sensing instruments at a target to obtain images, composition, surface structure, and temperature data. The orbiter's umbrella-like high-gain antenna did not deploy, so Galileo's computer was reprogrammed to compress and record the data taken during flybys to the on-board tape recorder. The data is returned to Earth during the remainder of each orbit using the low-gain antenna and modifications to the ground receiving systems of the Deep Space Network. Galileo is powered by two radioisotope thermoelectric generators. It used a 400 Newton engine to go into Jupiter orbit, but fine-tunes each new orbit with 10-Newton thrusters.



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Project Galileo Outreach Office
"Bringing Jupiter to Earth"
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