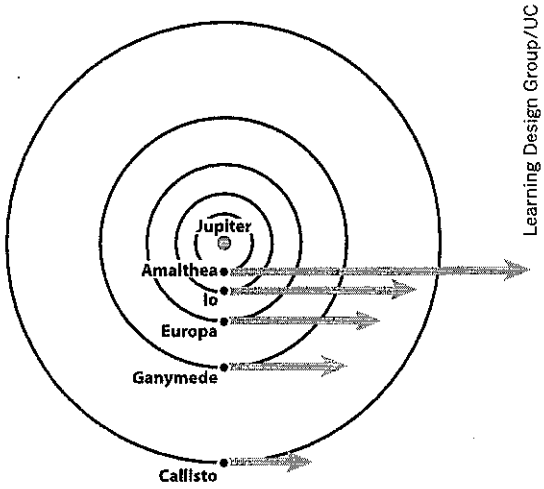
Moons of Jupiter

If you look at the planet Jupiter through a telescope, you can see what looks like a little Solar System model. At the center is Jupiter, just as the Sun is at the center of the Solar System. Four large moons are visible orbiting around Jupiter, just as the Solar System planets orbit the Sun. There are also many smaller moons of Jupiter that are harder to see from Earth—at least 60 have been discovered so far. Jupiter's moons orbit the planet at different distances. The moons that are farther from Jupiter take longer to orbit than the moons that are closer. That might seem obvious, because the moons that are farther away have a longer trip to get all the way around Jupiter. However, that's not the only reason the farther moons take longer to orbit. The closer a moon is to Jupiter, the faster it moves. The closer moons not only have a shorter distance to travel around Jupiter, they also travel at greater speeds than the moons that are farther away.



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The diagram above shows the orbits of six of Jupiter's moons. The arrows show how fast the moons are orbiting: the longer the arrow, the faster the moon.

The distances are shown to scale. To find the orbit of Himalia, the most distant moon, look at the very bottom of the page.

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Amalthea is one of Jupiter's small inner moons.

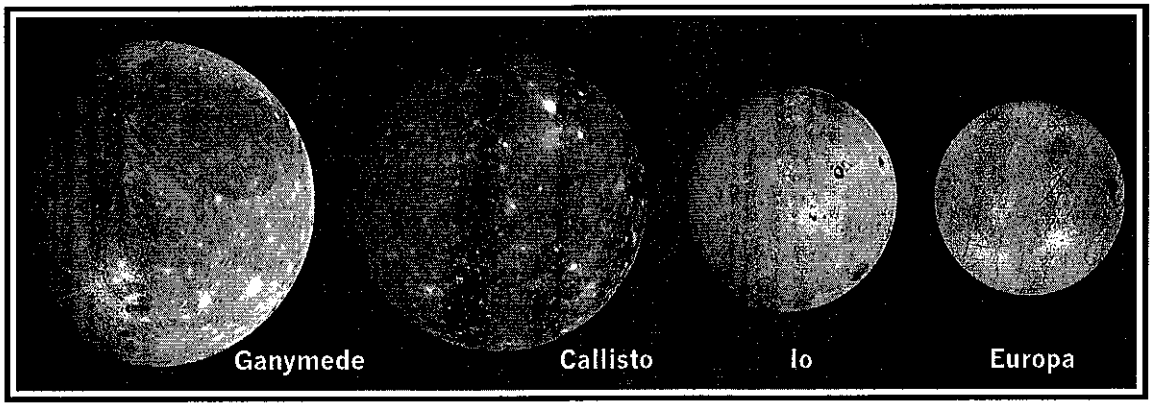
Himalia

Orbit Data for Jupiter's Six Largest Moons

Moon	Average distance from Jupiter	Orbital period (how long it takes to orbit Jupiter)	Average speed of orbit
Amalthea	181,400 km	12 hours	27 km per second
Io	421,800 km	43 hours	17 km per second
Europa	671,100 km	85 hours	14 km per second
Ganymede	1,070,400 km	172 hours	11 km per second
Callisto	1,882,700 km	401 hours	8 km per second
Himalia	11,461,000 km	6,013 hours	3 km per second

Why do closer moons orbit faster than faraway moons? The closer a moon is to Jupiter, the stronger the pull of gravity between Jupiter and that moon. In order to keep orbiting around instead of crashing into Jupiter, a nearby moon has to be traveling very fast. The pull of gravity between Jupiter and faraway moons is weaker, so the outer moons do not have to travel as fast to stay in orbit. In fact, if they were traveling faster, the outer moons would fly off into space instead of orbiting Jupiter.

The closer an object is to the thing it is orbiting, the faster that object has to be traveling to stay in orbit. The farther an object is from the thing it is orbiting, the slower that object has to be traveling to stay in orbit. These rules are not only true for Jupiter's moons, they are true for all objects that orbit. If you look at a data table showing the Solar System planets and their orbits around the Sun, you'll see that the closest planet orbits the Sun fastest, and the farthest planet orbits slowest. Jupiter and its moons really are like a little model of the Solar System.



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