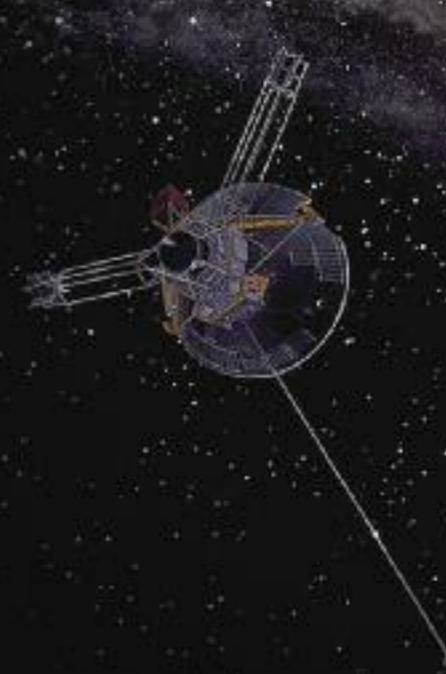


There have been many expeditions to explore Jupiter and its moons. In 1977, the Voyager probes were launched to get a closer look at the planet, and in 1990, the spacecraft Ulysses, launched to study the north and south pole of the Sun, first travelled to Jupiter where the strong gravitational pull helped redirect the spacecraft. One important example of a mission to investigate Jupiter is the Pioneer 10 mission that took place in 1972. Pioneer 10 was the first spacecraft to pass through the Asteroid Belt which lies between Mars and Jupiter and explore the outer Solar System. The mission was the first of many, and revealed the amount of hydrogen and helium in the planet's atmosphere. Also the mission was the first to show clear evidence that Jupiter has an enormous magnetic field around the planet).

Journey to Jupiter

Later on in 1989 NASA sent the spacecraft Galileo into space to study Jupiter and its moons. In 1995



Galileo was directed into Jupiter's atmosphere, to avoid a collision with one of Jupiter's moons, which may have contained life with Earth's bacteria. The spacecraft penetrated deep into the cloud layers and measured the amount of water and other chemicals in the atmosphere. The voyage of Galileo in space lasted for 14 years providing 8 years of service.

Pioneer 10 mission that took place in 1972. Pioneer 10 was the first spacecraft to pass through the Asteroid Belt which lies between Mars and Jupiter and explore the outer Solar System. The mission was the first of many, and revealed the amount of hydrogen and helium in the planet's atmosphere. Also the mission was the first to show clear evidence that Jupiter has an enormous magnetic field around the planet).



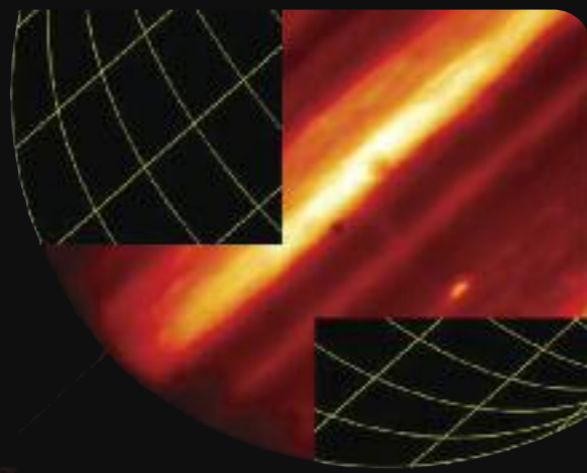
Jupiter is the fifth planet from the Sun and by far the largest planet in the solar system. It is so massive that over a thousand Earths could fit in its volume. Jupiter is a gaseous planet, possibly with a rocky core. There are ferocious winds around the surface of the planet, which cause the bands of different coloured gas seen on Jupiter, and which can start hurricanes such as the Great Red Spot. It has many moons orbiting around it but the four main ones, first observed by Galileo in 1610, are Io, Europa, Ganymede and Callisto. The planet Jupiter has a system of rings, known as the rings of Jupiter or the Jovian ring system, but they are very faint and mainly made of dust.

King of the Planets



Jupiter in Pictures

This infrared picture shows the temperature differences across the surface of Jupiter - far from being a cold, dead planet, Jupiter radiates lots of heat.



Jupiter eclipses the sun, allowing its faint rings to be seen. This image was snapped by Voyager 1.

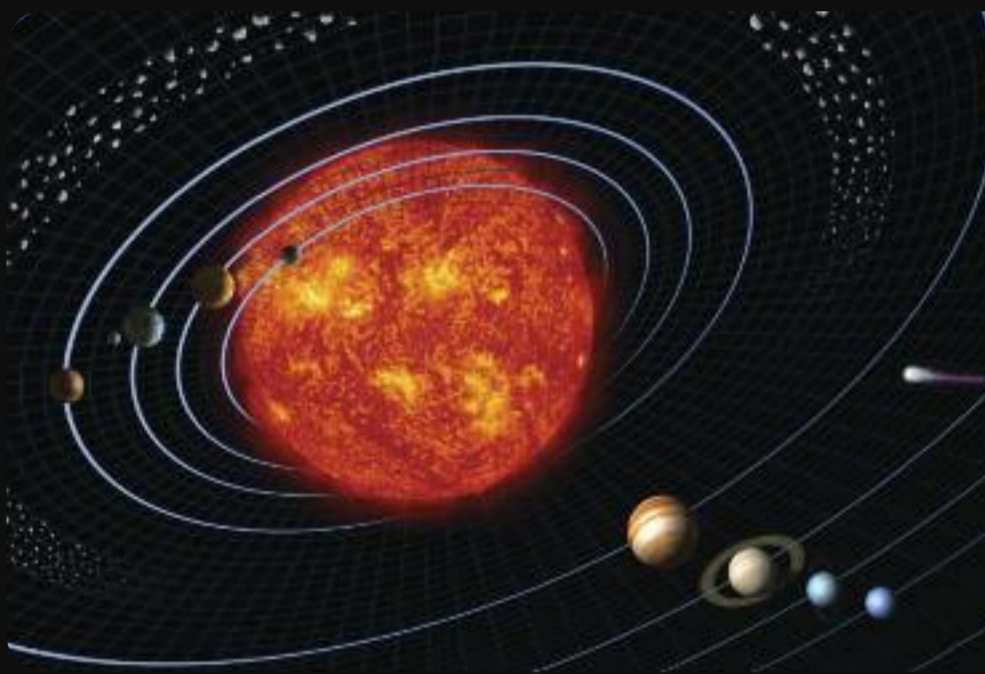


Jupiter's moon Io passes in front of the planet, eclipsing a small part of its surface - if you were standing in the black spot, you would see a solar eclipse.

The volume of Jupiter is 1.43 x 10¹⁵ km³. Now that's too big a number to really wrap your head around (it means 1.43 followed by 13 zeroes), but to give you an idea, you could cram more than 1,300 Earths inside Jupiter and still have room to spare. Jupiter has over 300 times the mass of earth and it is five times further from the sun than the earth. Also if you weigh 180 pounds on Earth, you would weigh 426 pounds just at Jupiter's cloud tops!

Jupiter can definitely lay claim to the title of "king" of all planets. Named after the king of the Roman gods, it is the biggest planet in our Solar System, with a diameter ten times greater than the Earth's. Jupiter's famous Great Red Spot (actually a giant, hurricane-like storm that's at least 2 centuries old) would easily swallow the Earth. Jupiter spins so fast on its axis that it bulges noticeably at its equator (a day on Jupiter is about ten hours long).

Jupiter versus earth



Unlike Earth, Jupiter actually radiates nearly twice as much heat as it receives from the Sun. Jupiter shrinks by about two cm each year, releasing energy as heat. This doesn't sound like a big decrease in size, but when it was first formed, Jupiter was much hotter, and twice as big.

Meet the Expert

Chris Castelli

Head of Space Science for the UK Space Agency



Q3) What do we have to do to get into a career like yours?

A) Well first things first: you will have to be interested in science, and especially in physics. Then, as any other professional working in my sector would say, through hard work and dedication you can get anywhere you want!

Q1) So Chris, what are the latest expeditions to Jupiter and its moons, and when will they happen?

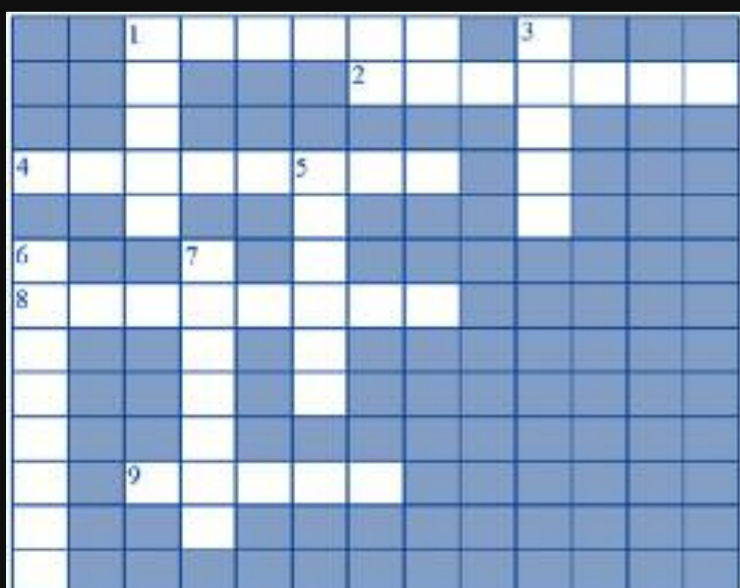
A) Well, there aren't many planned at the moment, but there is EJSM (which stands for Europa Jupiter System Mission), which is still in the planning phase. It is a mission which is a joint effort between NASA and ESA. If funded properly then it will be launched between 2020 and 2026.

Q2) How is the UK planning to be involved with future space missions?

A) In the UK we have a very strong science community. We are proposing to put instruments on the ESA space probes and satellites. These will be used to take detailed images in future missions.

Since we are curious and inquisitive people, and wanted to further investigate missions to Jupiter, we decided to ask an expert for more information. Meet Chris Castelli, Head of Space Science for the UK Space Agency. He previously worked at Leicester, using X-ray astronomy and space imaging systems. Below are some questions that we asked Chris during the interview:

Crossword



Across

- The visible flash of light you see when a meteoroid passes through the Earth's atmosphere.
- This could be the king of all planets.
- One of Jupiter's moons, with a surface area of 87 million km².
- There are lots of them between Mars and Jupiter.
- A small icy solar system body, which becomes bright, with a long tail, when it passes near the Sun.

Down

- Jupiter has 63 of them.
- These can't compete with Saturn's, but are still there.
- Any icy moon, possibly with a liquid ocean.
- The furthest Galilean moon from Jupiter.
- A giant storm on the surface of Jupiter.

Answers: Across: 1. Meteor 2. Jupiter 3. Europa 4. Ganymede 5. Asteroid 6. Comet 7. Redspot. Down: 1. Moons 2. Rings 3. Europa 4. Callisto 5. Redspot.

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Written and designed by students from St Pauls Way and Stepney Green School taking part in the 2010 Media Space Summer School.

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Voyage


Space For Young Explorers



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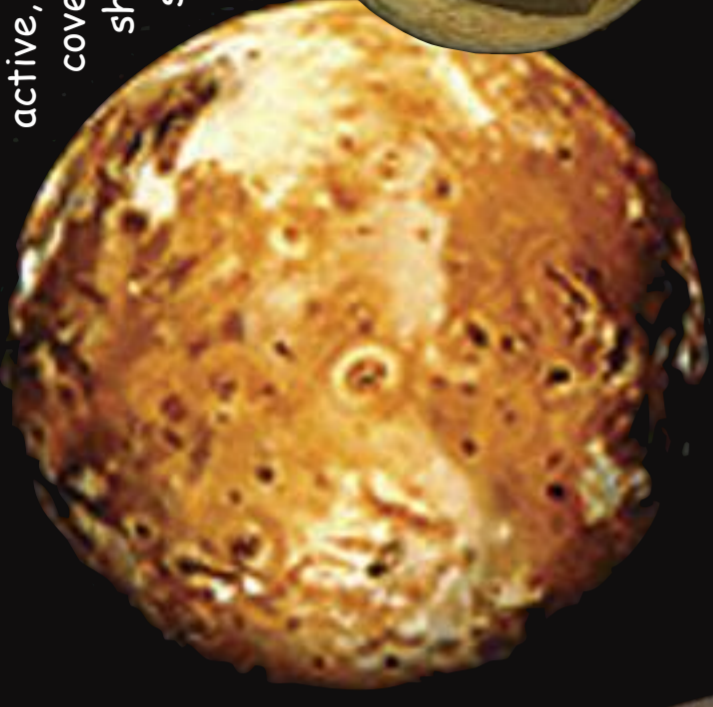
The Court of King Jupiter



Jupiter is surrounded by 63 moons, ranging in size from less than 10km in diameter to over 5000km. 47 of its moons are so small that they were not discovered until after 1975, but four - the Galilean satellites - were discovered as early as 1610, by Galileo, an Italian astronomer, who invented the telescope. They are the largest, and we know much more about them than the other moons.

Io

Jupiter's moon Io is one of the most exotic places in the Solar System. It was the first extraterrestrial body on which volcanoes were seen, and is incredibly active, with lava flows, lava lakes and giant calderas covering its sulphuric landscape. It has volcanoes shooting plumes of gas over 500 kilometres into space. Its mountains reach heights of 16 kilometres (52,000 feet), twice as high as Mount Everest.



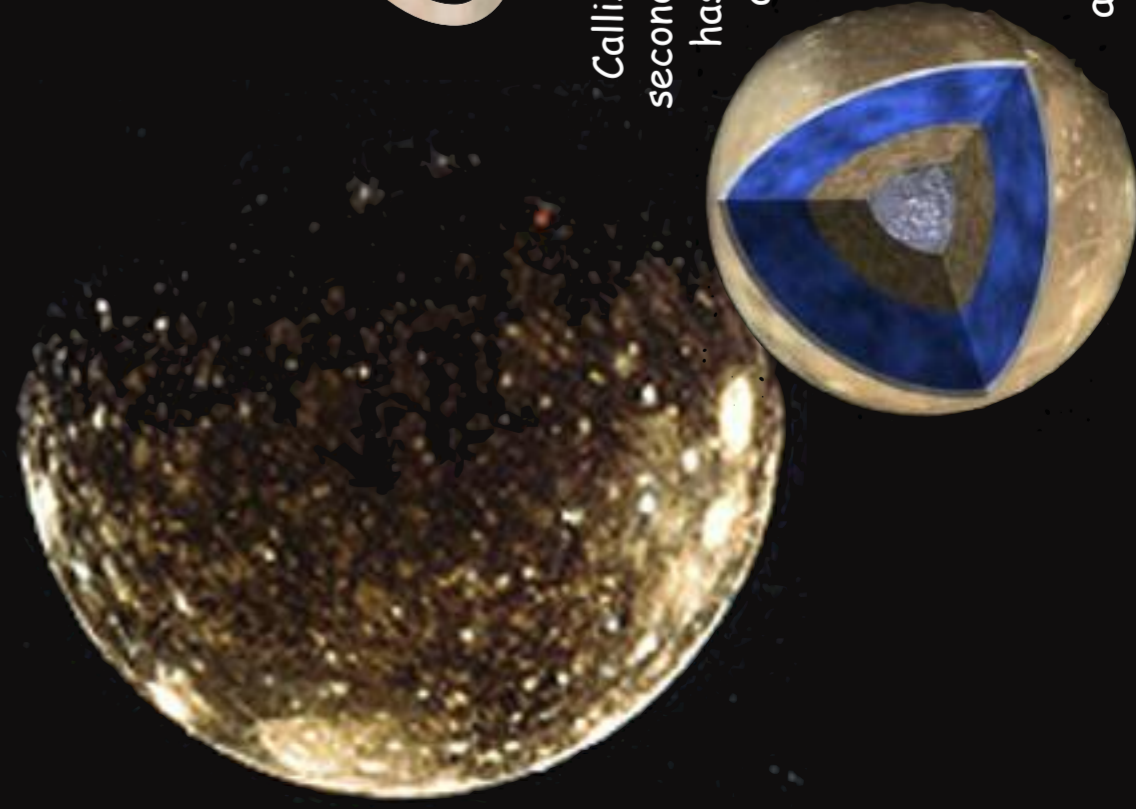
Europa

Europa is a very fascinating moon because astronomers believe it may contain a liquid ocean underneath its icy crust. As such, it is the most likely place in the Solar System for life outside Earth to exist. Europa is an almost perfect sphere with a diameter of 3138 km. The cracks which can be seen on the surface are fractures in the ice as a result of tidal flexing from Jupiter. This is where the strong gravity of Jupiter periodically squeezes the planet, warming it up, and keeping the liquid from freezing underneath.



Callisto

Callisto is the third-largest moon in the Solar System and the second largest in the Jovian system, after Ganymede. Callisto has about 99% the diameter of the planet Mercury but only about a third of its mass. It is the fourth Galilean moon of Jupiter by distance, with an orbital radius of about 1,880,000 km. Scientists believe that Callisto is composed of approximately equal amounts of rock and ice, and may have an ocean, although not as warm as Europa, since it is too far away from Jupiter to be heated by tidal forces. Like our moon, one side of Callisto always faces Jupiter, and it has a heavily cratered surface.



Ganymede

Ganymede is Jupiter's largest moon, with a diameter of 5262km, as well as the largest natural satellite in our solar system. It's so big, it's actually larger than Mercury in diameter (but not in mass). Ganymede is the only moon to be named after a male figure (a Greek prince) and the only moon with its own magnetosphere - a magnetic field which deflects the charged particles coming from the Sun. Ganymede is composed of approximately equal amounts of silicate rock and water ice. It has an iron-rich liquid core.

