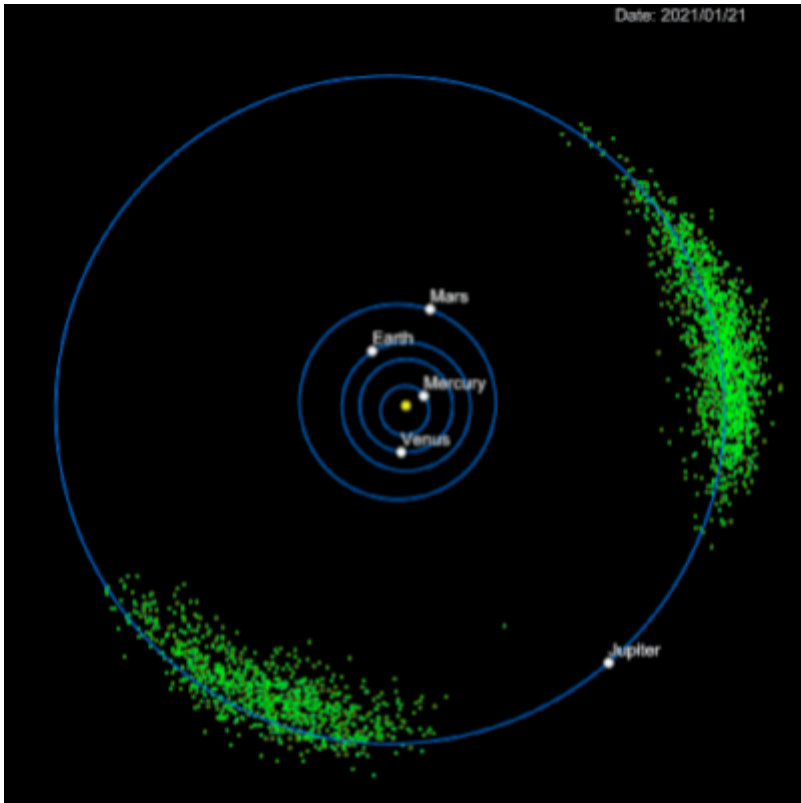


LEARN - What are Trojan asteroids?



Source: Petr Scheirich (Astronomical Institute of the Czech Academy of Sciences)

Learning Objective:

To learn about the Trojan asteroids.

Overview:

Trojans are a special group of asteroids that can share orbit with a planet or larger body without risk of collision because of regions where there is gravitational stability.

Location:

In the Solar System, there are regions with large concentrations of asteroids and comet-like objects. The closest to us is the great belt located between Mars and Jupiter, commonly called the Main Belt.

Another concentration is known as Trojan asteroids, which can be found sharing the orbits of some planets at points where their

gravitational influence allows them to be stable. We can find examples in the orbits of gas giants and even in rocky ones, such as Mars and even on Earth.

The most notable case of Trojan asteroids are those of Jupiter: two large concentrations of asteroids called "Greek field" and "Trojan field". Both with hundreds of thousands of objects that share the orbit with the immense planet.

They share the orbit with the planet at a safe distance, with no real risk of collision because of two points of stability, called [Lagrange points](#), located 60° in front of and behind the main body. These asteroids follow the planet like a guard going in front of and behind the orbit described by the planet.

First observations and frequency of discoveries:

In the 18th century, Italian mathematician Joseph-Louis Lagrange predicted that a small celestial body could share an orbit with a planet at a certain distance, remaining gravitationally stable and captured. The first official discovery of a Trojan took place in 1906, discovered by the German astronomer Max Wolf, later named 588

Achilles. Since then, new objects have been discovered in the same region close to Jupiter, surpassing 300 at the beginning of this century and thousands today.

Nomenclature:

Jupiter's Trojan asteroids are named after characters from the mythological Trojan War. Asteroids at Lagrange point L4 are named after Greek heroes, while asteroids at point L5 are named after Trojan heroes, with some exceptions to this rule.

Lucy Mission:

Trojan asteroids can provide essential clues to understanding the formation of the Solar System. NASA's Lucy spacecraft will visit the Trojan's surrounding Jupiter marking the first ever mission to visit this group of asteroids. On-board instruments and large antennas equip the spacecraft to investigate their geology, composition, mass, density and volume. Learn more about the Lucy Mission [here](#) and a fun paper model activity for children [here](#).

Learn more about this subject by visiting these websites:

[Jupiter's Trojan Asteroids \(video\)](#)

[How Were the Trojan Asteroids Discovered and Named? \(article\)](#)

[Jupiter and its ten largest trojan asteroids \(interactive orbit model\)](#)

[An imaginary trip to The Largest Jupiter Trojan: 624 Hektor and its moon \(video\)](#)

[2021 NASA Lucy Mission Update](#)