The Galilean Moons of Jupiter - Educator's Guide (Ages 16-18)

At the end of these Night Sky activities students will understand:

- The four largest moons of Jupiter were discovered by Galileo
- Their discovery helped lead to the fall of geocentrism
- The moons' physical characteristics are related to their distances from Jupiter
- The more geologically active moons have warm interiors

Accessible Learning:

- Text size can be increased in the Preferences section

- Star numbers can be reduced by sliding two fingers down the screen

App Essential Settings

No essential settings are required for this activity.

Astronomy background information

Jupiter has a family of at least 80 moons. The four largest moons are known as "Galilean satellites" as Galileo Galilei discovered them with his first telescope. As they orbited Jupiter rather than Earth, Galileo used the moons as evidence against geocentrism.

Io is slightly larger than our own Moon and is mainly made of silicates like the Moon. While the Moon's surface is cold and dead basaltic rock, Io has a sulphurous surface and is the most volcanic world known.

Europa is slightly smaller than Earth's Moon with an airless, cold and icy surface. Its iron core is surrounded with rock but above this is a deep layer of salty water under its icy crust.

Ganymede is the largest known moon; it is even larger in diameter than planet Mercury. Ganymede has an icy crust, under this there is another ocean and layers of ice around an iron-rich molten core.

Compared to the other moons, Callisto is literally frozen solid. Its surface has stayed virtually unchanged for the past four billion years or so.

As the moons orbit Jupiter, they experience "tidal heating". Jupiter's gravity induces tides in the moons' interiors, generating friction. For the three inner moons, this effect keeps their interiors warm enough to keep rock molten and water liquid. The further a moon is away from Jupiter the less it is warmed by this effect. Callisto's orbit is so far from Jupiter that this tidal heating is essentially non-existent. As a result of this Callisto has a cold interior.