

“THE EARTH WITHIN THE UNIVERSE”



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1. THEORIES ABOUT THE UNIVERSE

During the history has been two as the most important theories about the universe:

- **The Geocentric Theory:** The Earth is at the centre of the universe and the rest of the astronomic bodies move around it. (Aristotle, 384-322 B.C.)
- **The Heliocentric Theory:** The Sun is at the centre of the universe and the Earth revolves around it. (Copernicus, 1473-1542)

Today we know the Earth revolves around the Sun, but there are many more stars. We also know that our galaxy is the **Milky Way**, but there are many more in the Universe.

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1. THEORIES ABOUT THE UNIVERSE

Today we know:

- The **Universe** consist of billions or trillions of galaxies.
 - The **Galaxies** are enormous groups of stars and interstellar gas and dust.
 - The **Stars** are large spheres of hydrogen and helium which release energy through nuclear fusion.
 - **Nebulae** are very large clouds of dust and gas in outer space.
 - **Star cluster** are related stars that are close to each other.
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1. THEORIES ABOUT THE UNIVERSE

- OUR GALAXY, THE MILKY WAY

Contains hundreds of billions of stars, including the Sun, and it is composed of a **nucleous** of old stars, a **disc** of young stars and a **halo** of isolated stars.



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2. THE SOLAR SYSTEM

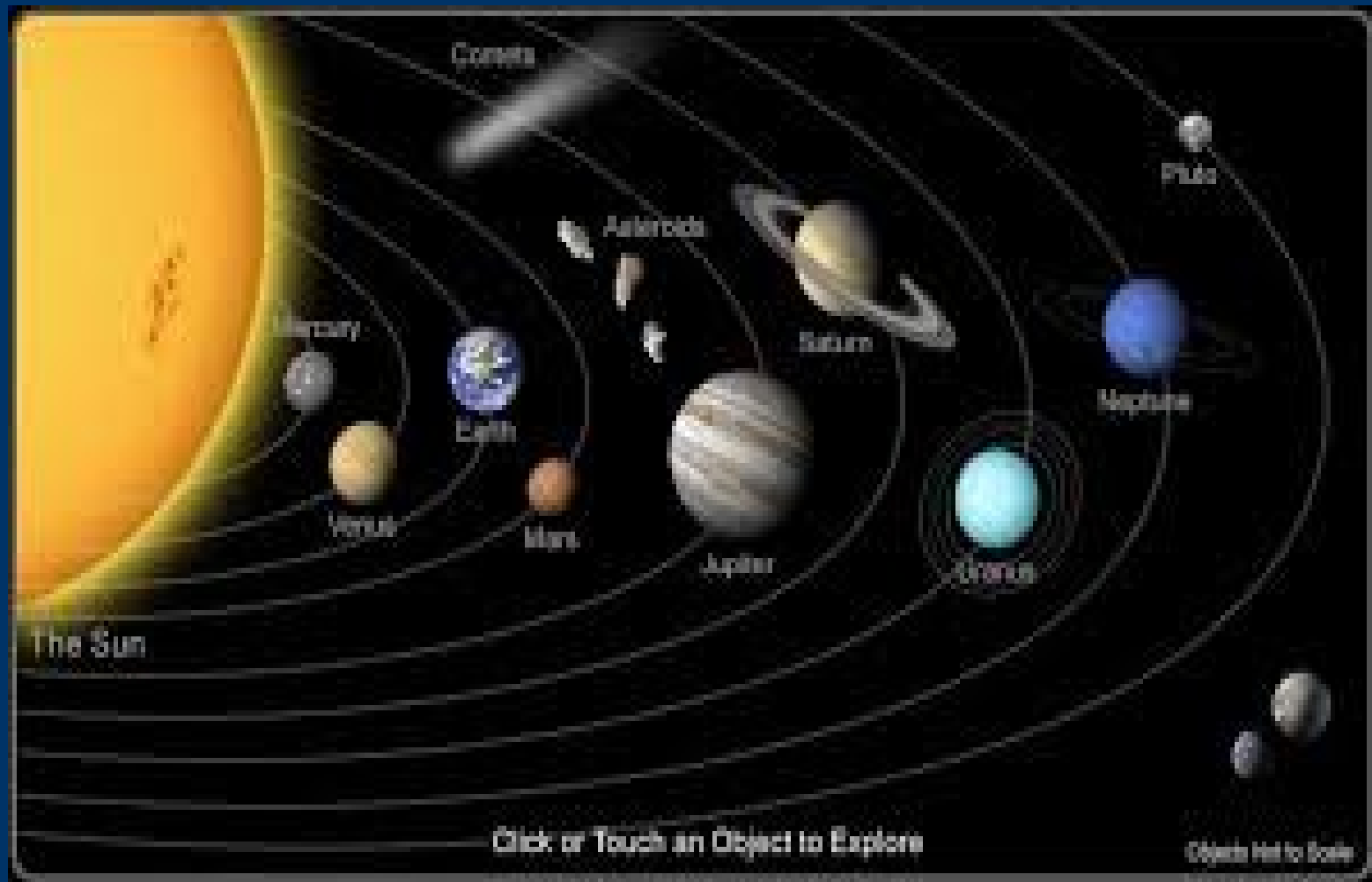
The Solar System is composed of:

- **The Sun**: It is a medium-sized star, which is composed of 75% hydrogen and 25% helium. The Sun emits light and its nucleus is about 15.000.000°C.
- **Inner Planets**: **Mercury, Venus, Earth and Mars**. They are small and solid.
- **Outer Planets**: **Jupiter, Saturn, Uranus and Neptune**. They are big and gaseous.
- **Planetoids**: **Pluto, Ceres and Eris**.
- **Comets**: Consist of rock, ice and dust.

Some planets have satellites moving around them, as the Moon around the Earth.

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2. THE SOLAR SYSTEM



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2. THE SOLAR SYSTEM

Features of the planets:

- Revolution: It is the planet's movement around the Sun. The time that a planet takes to orbit the Sun is called a **year**.
 - Rotation: It is the planet's movement around their axis. The time that a planet takes to rotate around its own axis is called a **day**.
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3. THE PLANETS

MERCURY:

- It is the closest planet to the Sun.
- Mercury doesn't have satellites, and doesn't have atmosphere neither, so the temperature between day and night varies widely.
- Mercury's rotation is slow, so its days are very long (59 Earth's days).



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3. THE PLANETS

- VENUS:

- It has a similar density than Earth, but its atmosphere is denser.
- One day in Venus lasts more than a year in Earth.
- Venus doesn't have satellites.



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3. THE PLANETS

- **EARTH:**

- Earth has a optimal conditions for life to develop because the average surface's temperature is 15°C and it has large masses of liquid water.
- The atmosphere is mainly composed of nitrogen and oxygen.
- It has a satellite, the **Moon**.



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3. THE PLANETS

- MARS:
 - A day in Mars last similar than Earth and this planet also has seasons.
 - Its atmosphere contains 95% of carbon dioxide, and so is not breathable.
 - Mars has two small **rocky satellites**.



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3. THE PLANETS

- **JUPITER:**

- It is the biggest planet in the Solar System.
- It is composed of 90% hydrogen and 10% helium.
- Jupiter has a **rocky core** and also has bands of different colors parallel to the equator.
- Jupiter has six large satellites, and four smaller ones.



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3. THE PLANETS

- SATURN:

- It is the second biggest planet and it is composed of 97% hydrogen and 3% helium.
- Saturn has a **ring system** made of ice, small rocks and dust.
- It has seven large satellites and around thirty small ones.



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3. THE PLANETS

- URANUS:
 - This planet is composed of hydrogen, helium and methane.
 - Its temperatures are very low, and so it is **frozen**.
 - Uranus has many satellites, and five of them are very large.



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3. THE PLANETS

- NEPTUNE:
 - Neptune is similar to Uranus in size and composition.
 - It is also a frozen planet.
 - It also has many satellites.



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4. THE EARTH-MOON SYSTEM.

Earth has two different movements:

- **Revolution:** Earth takes 365,25 days (a year) to complete this movement. The plane of the Earth around the sun is the **Plane of the Ecliptic.**

The seasons are caused by revolution and the tilt of the axis of rotation ($23,5^\circ$). During the seasons the temperature changes according to the angle at which the Sun's rays hit the Earth.

- **Rotation:** It is the Earth's movement around its axis. It is 24 hours long and produce days and nights.
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4. THE EARTH-MOON SYSTEM.

- THE MOON:

- The Moon moves around the Earth and around its axis at the same time, so we always see the same side of the Moon.

- We can watch different phases on the Moon, which are determined by the light it receives from the Sun (full moon, waxing moon, new moon and waning moon).

