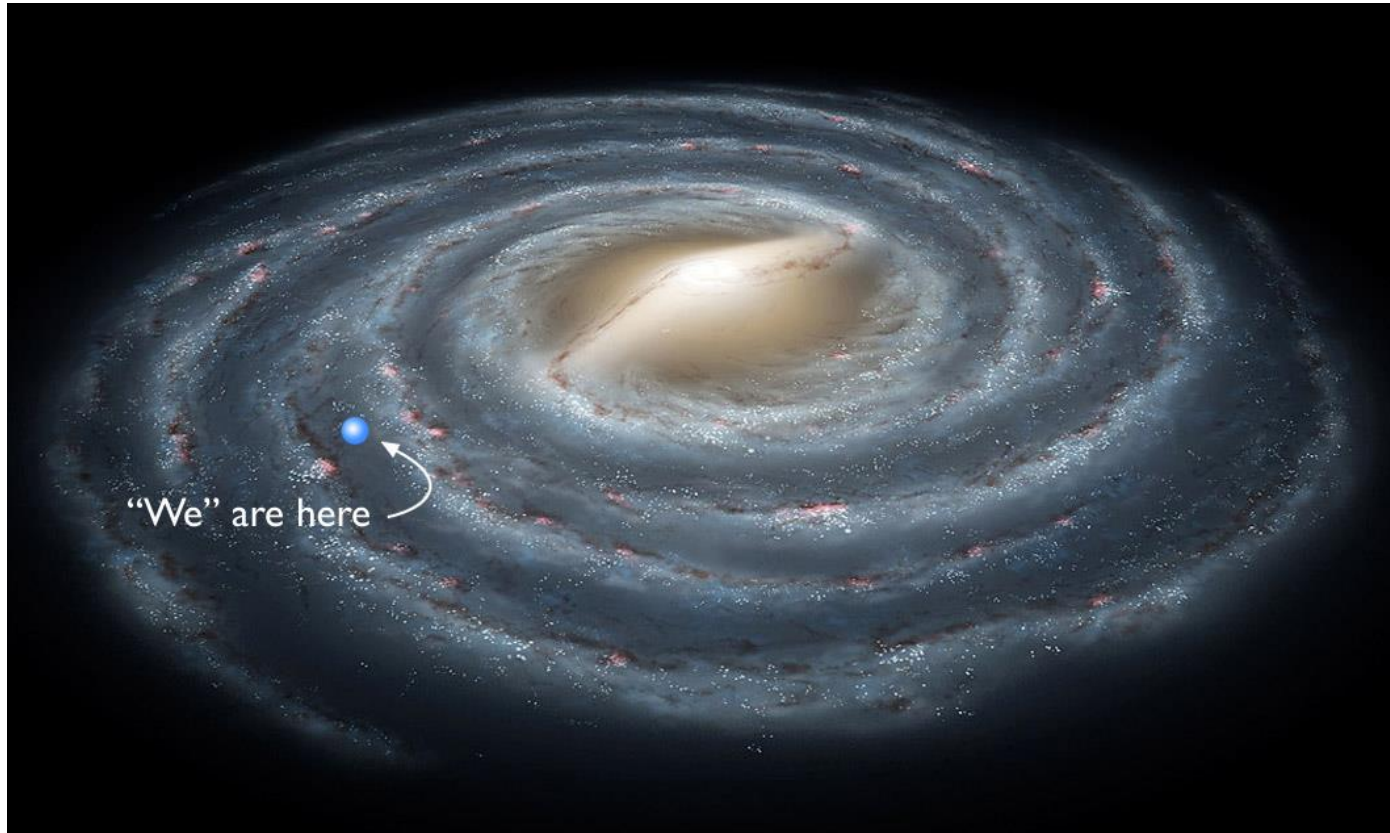


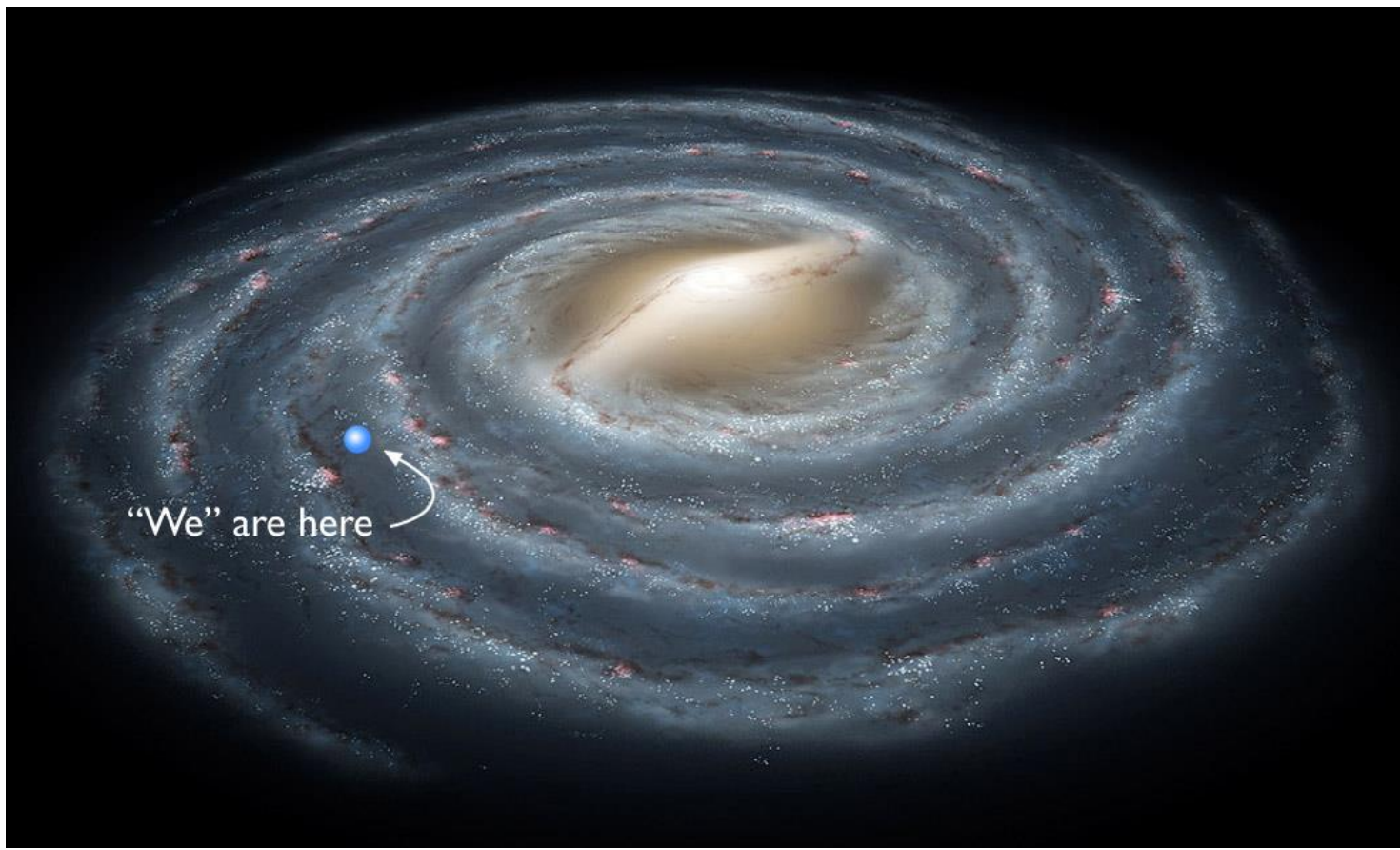
Lesson 04

Tour of the Solar System

Our solar system is located in the **Milky Way Galaxy**. The Milky Way Galaxy has 200-300 billion stars. Our Sun is one of those stars.



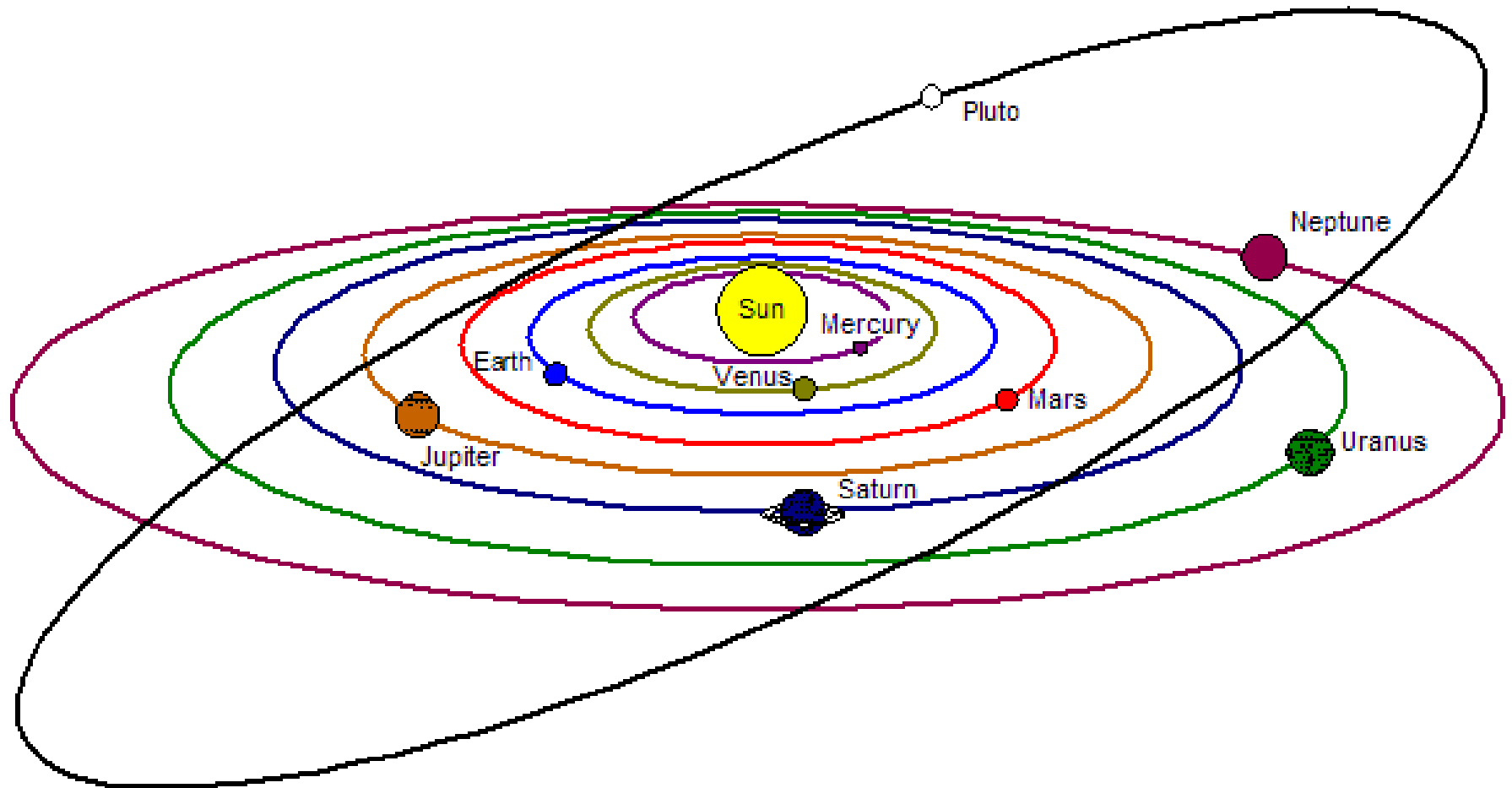
Milky Way Galaxy is a small **barred-spiral galaxy**. It is one of billions of galaxies in our observable universe.



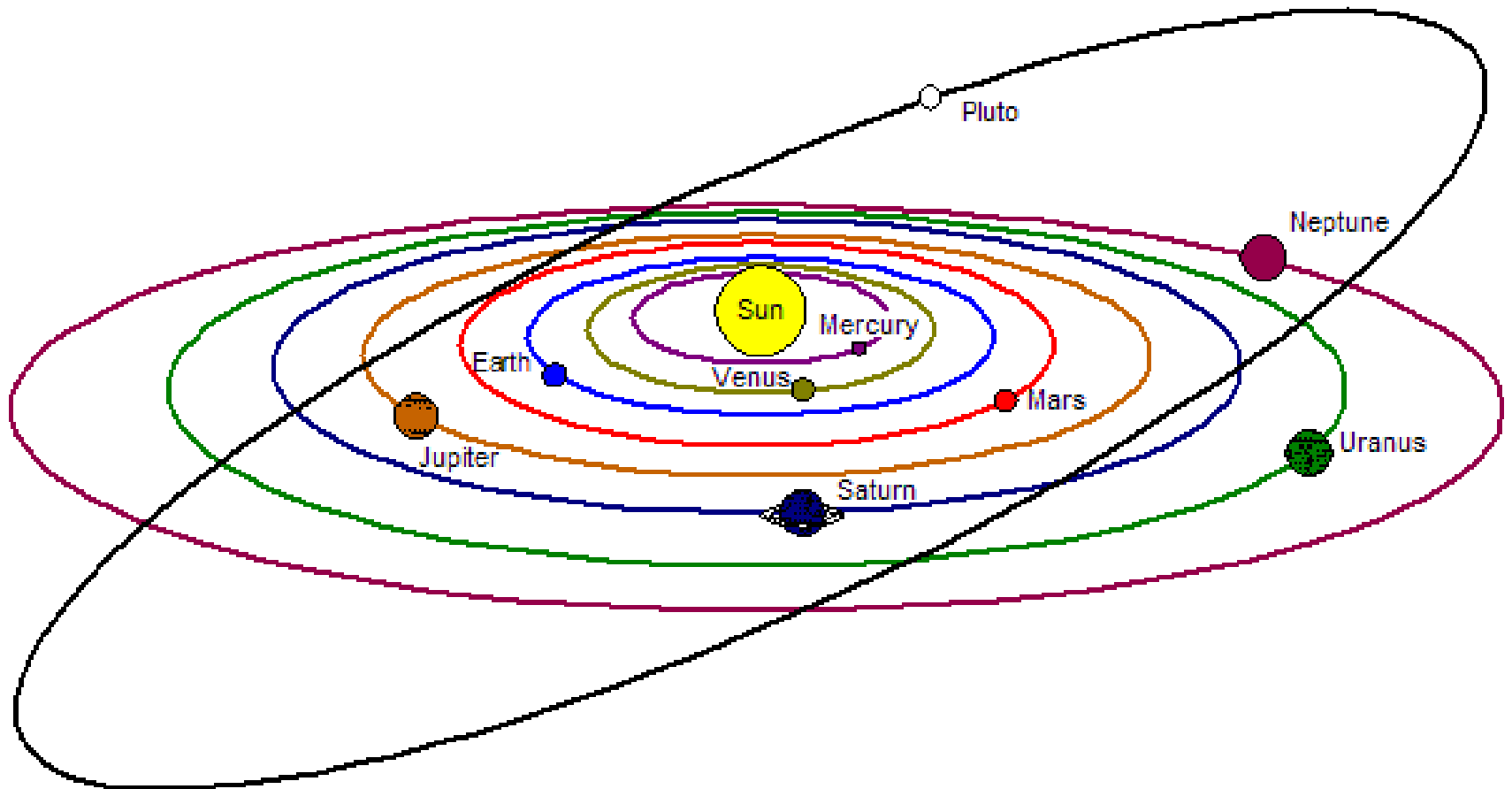
Our solar system lies in the *Orion Arm* near the outer edge of the Milky Way Galaxy.

The Sun and our solar system orbits the center of the galaxy at ~**226 million years**

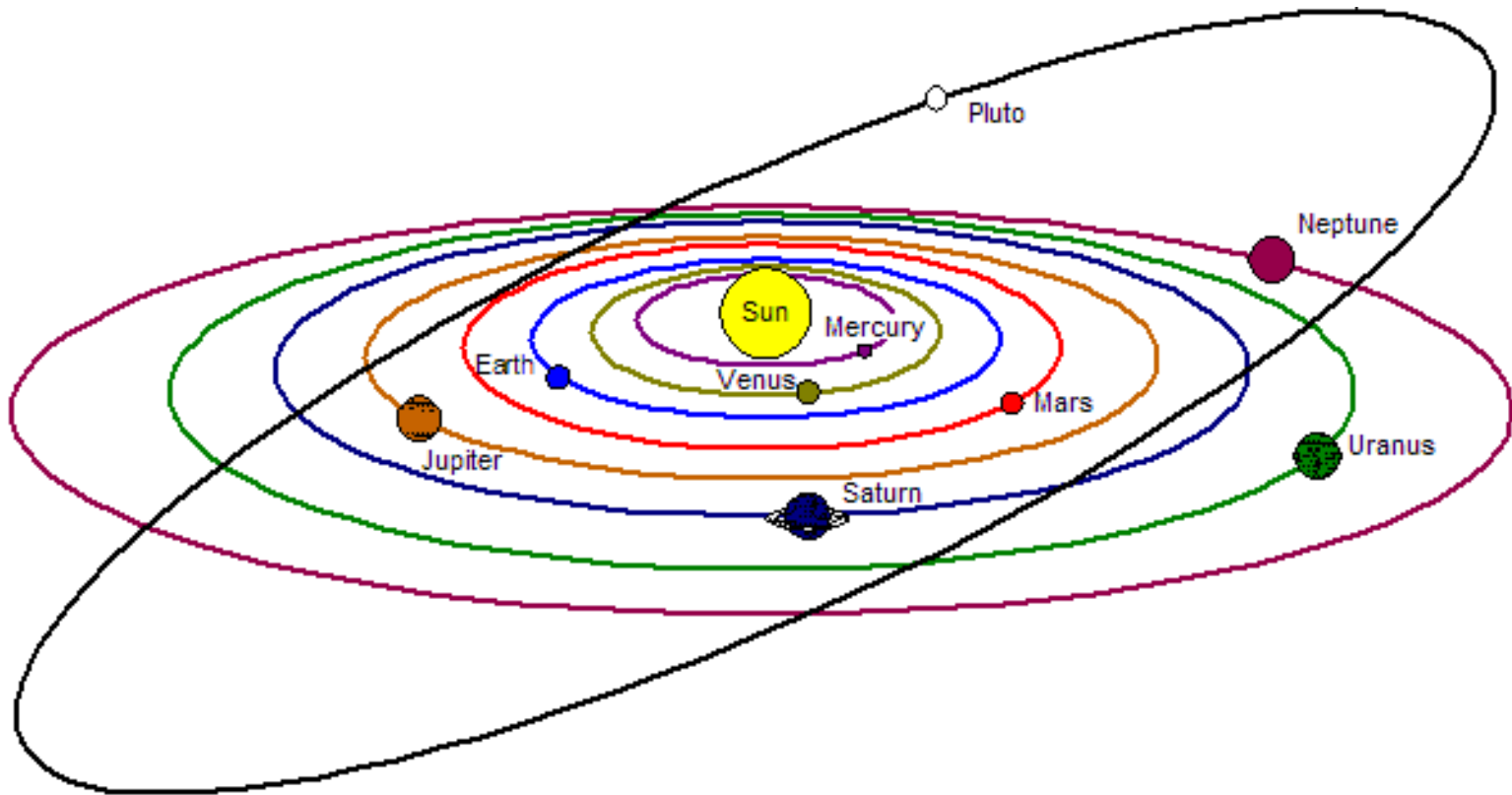
Solar System: A system of celestial objects that includes a centralized star with orbiting planets and other smaller orbiting bodies.



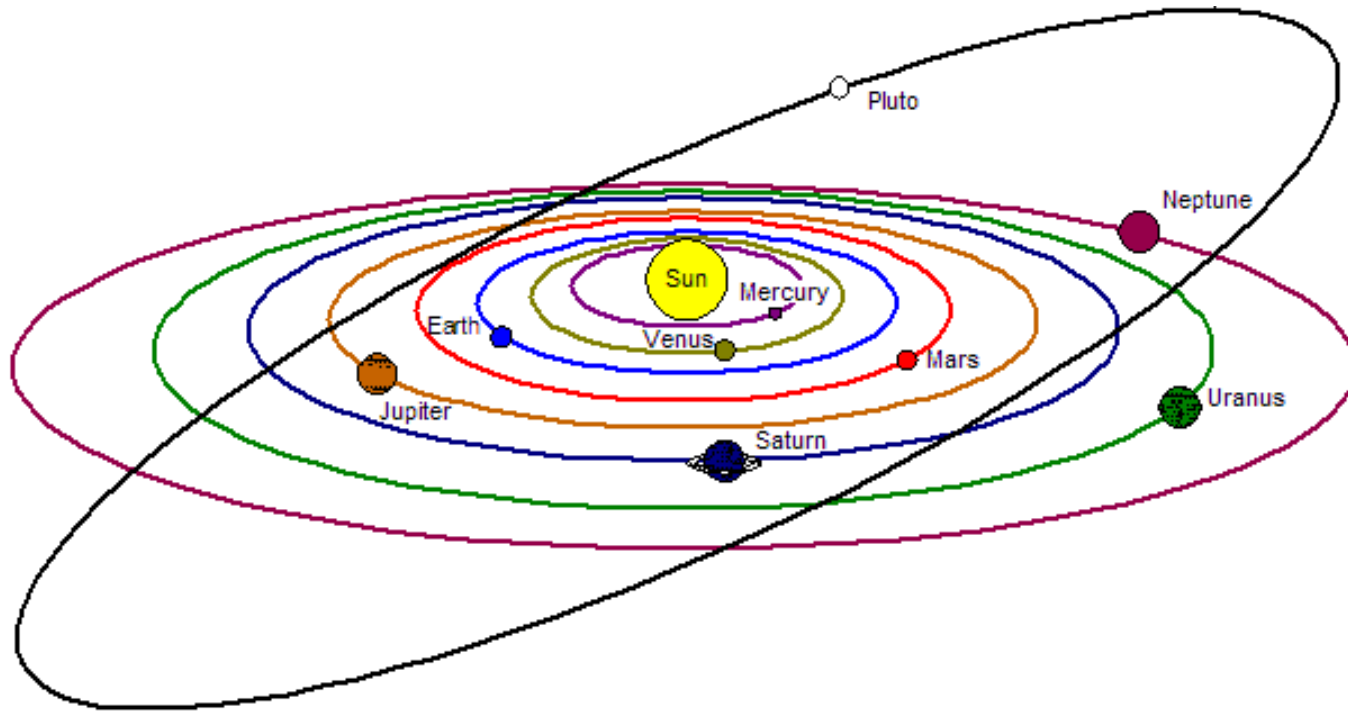
Earth's orbit lies 3rd away from the Sun. Earth's orbit lies in the **Plane of the Ecliptic**. All planets in our solar system also orbit the sun in the plane of the ecliptic, except Pluto whose orbit is offset.



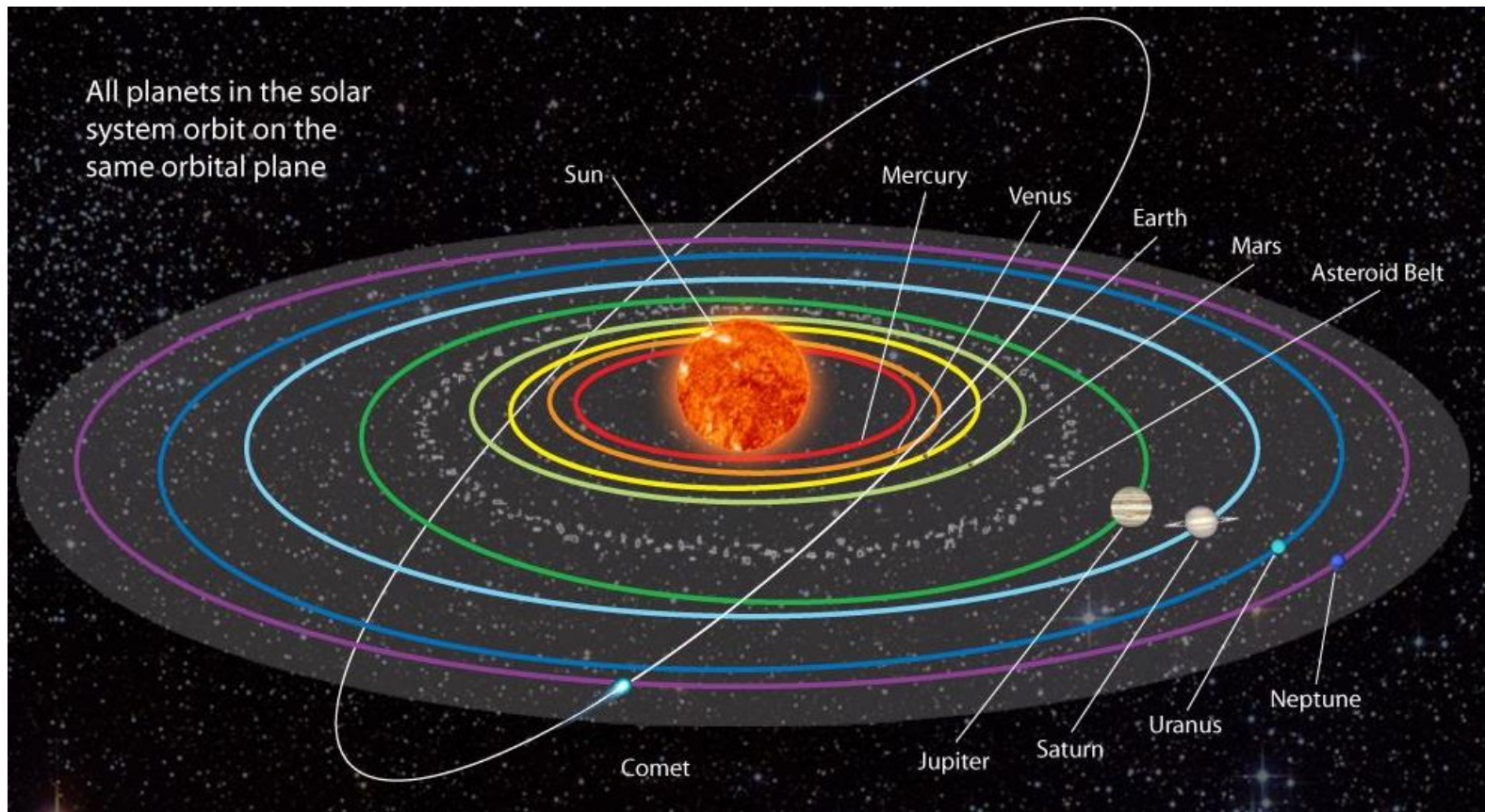
The **plane of the ecliptic** is the imaginary plane in space that extends outward from the equator of the sun. The eight planets of the solar system lie in the plane of the ecliptic. The solar system (ideally) looks like a flat disk of orbiting objects around the sun.



The accepted model of our solar system is the **Heliocentric Model**. *“Sun in the center”*.



The heliocentric model replaced the incorrect **Geocentric Model**. *“Earth in the center”*.



All planets in the solar system orbit on the same orbital plane

As a simplistic view, our solar system is like a **flattened disk** with the orbiting bodies. Looking down from the north pole perspective, all planets move **counterclockwise** in their orbits around the sun.



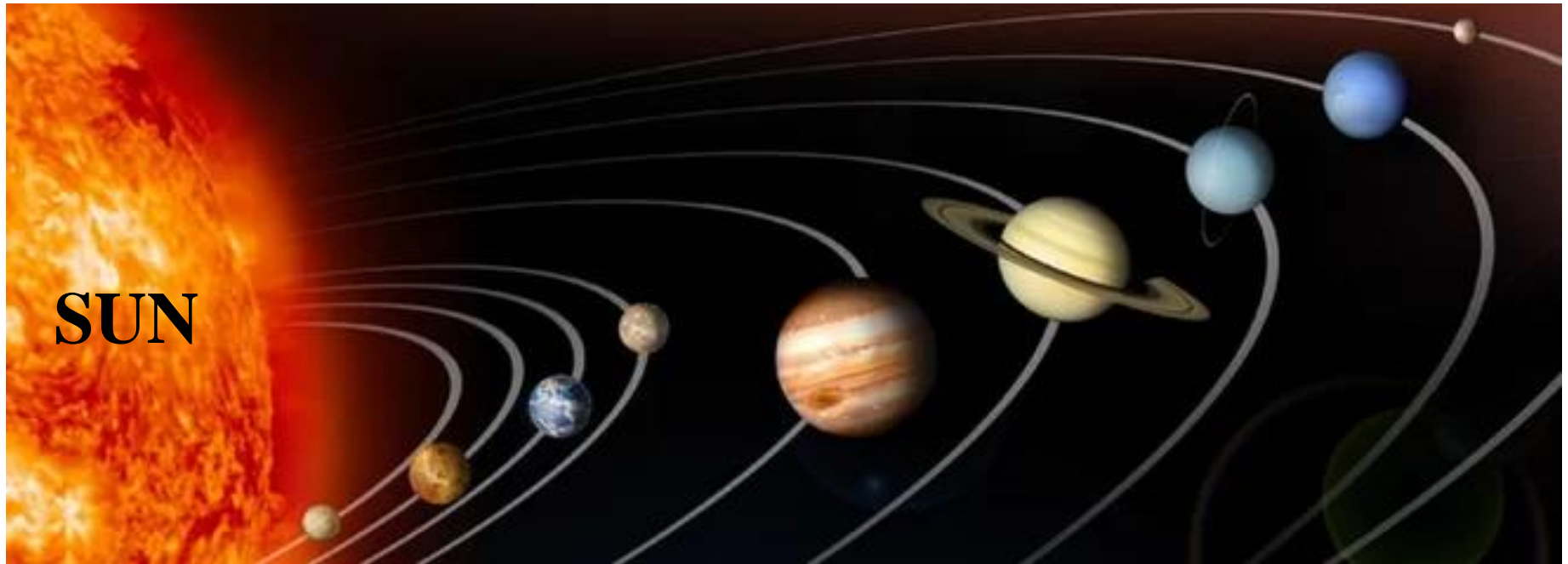
Sun: The star at the center of the solar system.

- Yellow dwarf star
- 4.6 Billion Years old

The sun contains ~ **99.9%** of the total mass of the solar system. The Sun's mass is **700-times greater** than the combined mass of all other matter in the solar system.

4 Terrestrial planets
(small inner planets)

4 Jovian planets
(large outer planets)



Additional bodies in the solar system: Moons, comets, asteroids, dwarf planets, and dust.

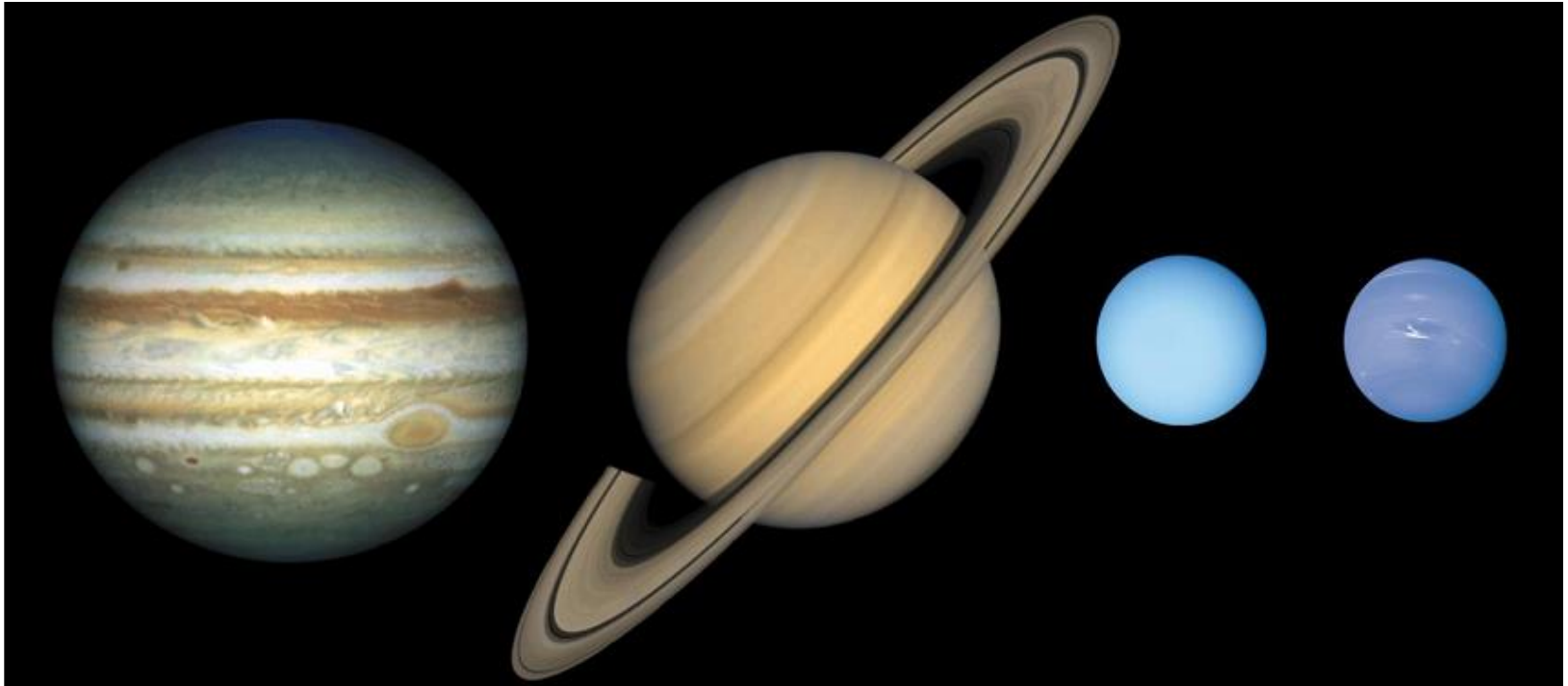
Terrestrial Planets: “Earth-like”



Mercury, Venus, Earth & Mars

- Small in size.
- Inner solar system. Orbit closest to the Sun.
- Made of rock and metal.

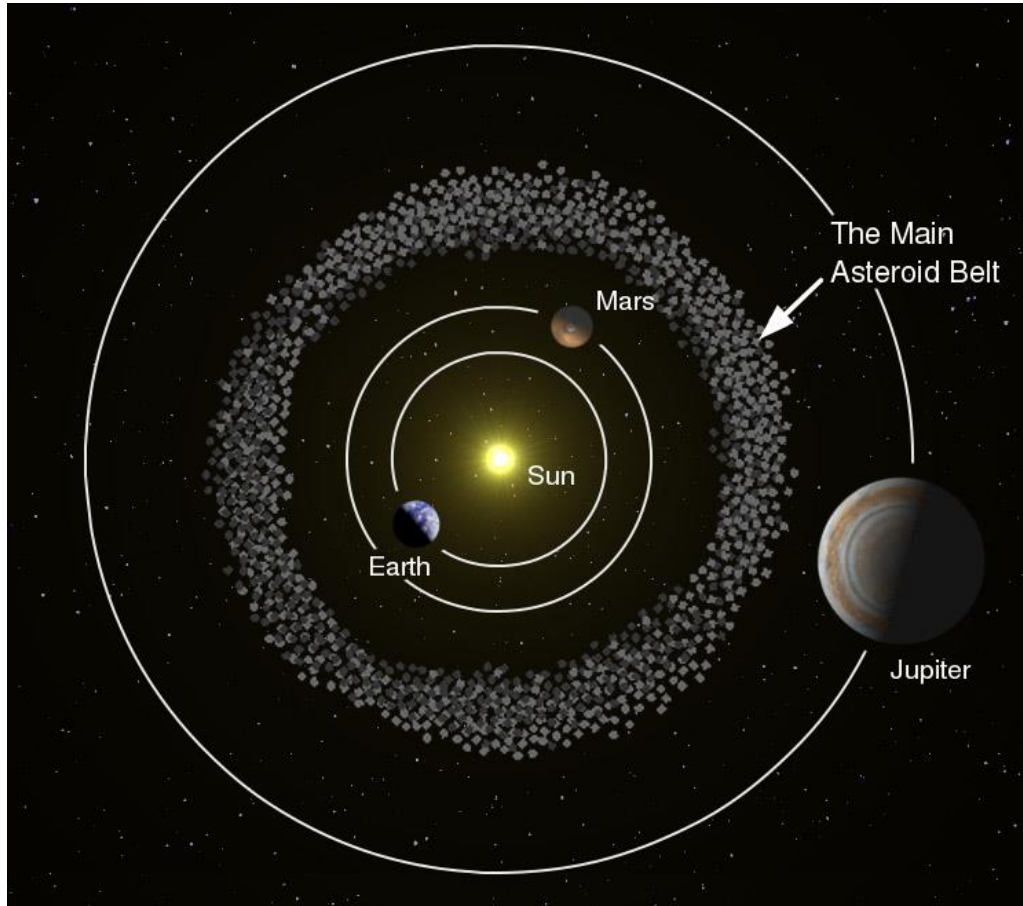
Jovian Planets: “God-like, Jupiter like”

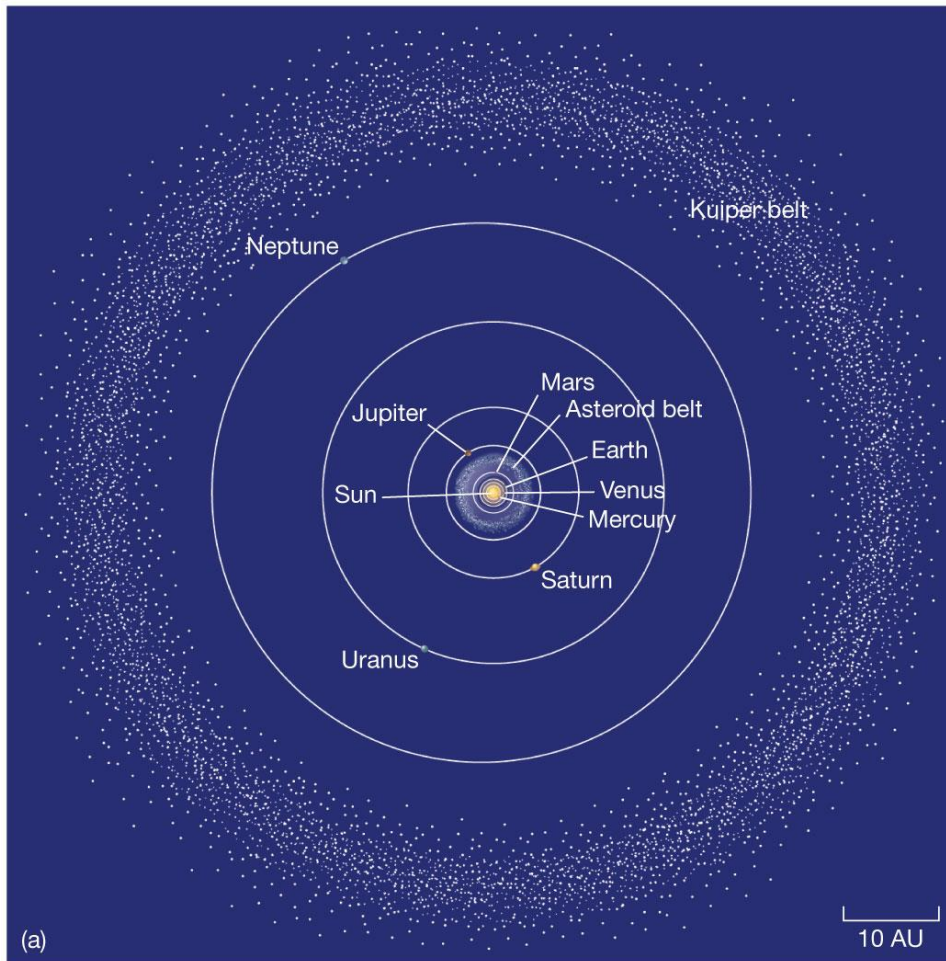


Jupiter, Saturn, Uranus, & Neptune

- Large in size
- Outer solar system. Orbits farther from Sun.
- Made of gas with no solid surfaces.

Main Asteroid Belt: The zone of the solar system that lies between the orbits of Mars and Jupiter. The asteroid belt contains millions of orbiting asteroids and the dwarf planet **Ceres**.





© 2011 Pearson Education, Inc.

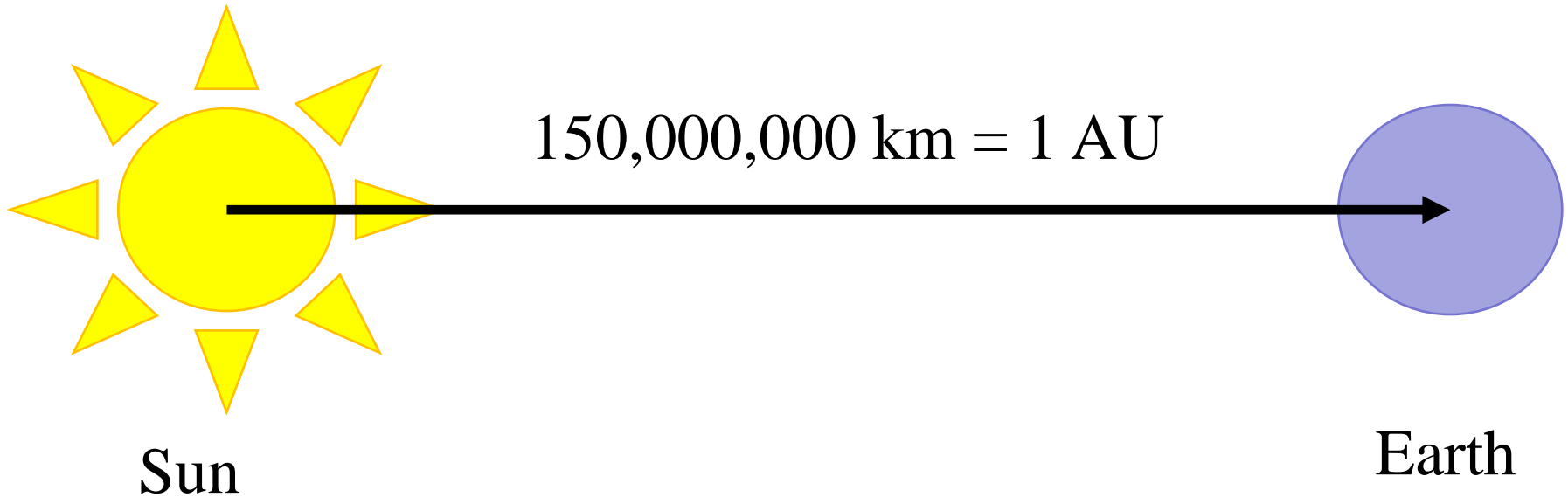
Kuiper Belt: The expansive region of the solar system (30-50 **astronomical units** of distance from the sun) beyond Neptune's orbit that contains billions of orbiting icy bodies, **dwarf ice planets**, and short period comets.

Oort Cloud: Immense spherical cloud that surrounds the solar system disk, made of trillions of small icy bodies. Distance extends from 5,000-100,000 astronomical units of distance outward from the Sun.



The most primitive left-over remains of the original material from which the solar system formed.

An **astronomical unit (AU)** is the measure that represents the average orbital distance between the geometric center of the Sun to the center of the Earth.



The astronomical unit (AU) is used to compare relative distances between the sun and the planets or other orbiting bodies.

Mercury	58,000,000 km	0.39 AU
Venus	108,000,000 km	0.72 AU
Earth	150,000,000 km	1.00 AU
Mars	228,000,000 km	1.52 AU
Jupiter	484,000,000 km	3.23 AU
Saturn	887,000,000 km	5.91 AU
Uranus	1,784,000,000 km	11.9 AU
Neptune	2,794,000,000 km	18.6 AU

The distance between the Sun and the 8 planets of the solar system in km and AU.