

# The Solar System

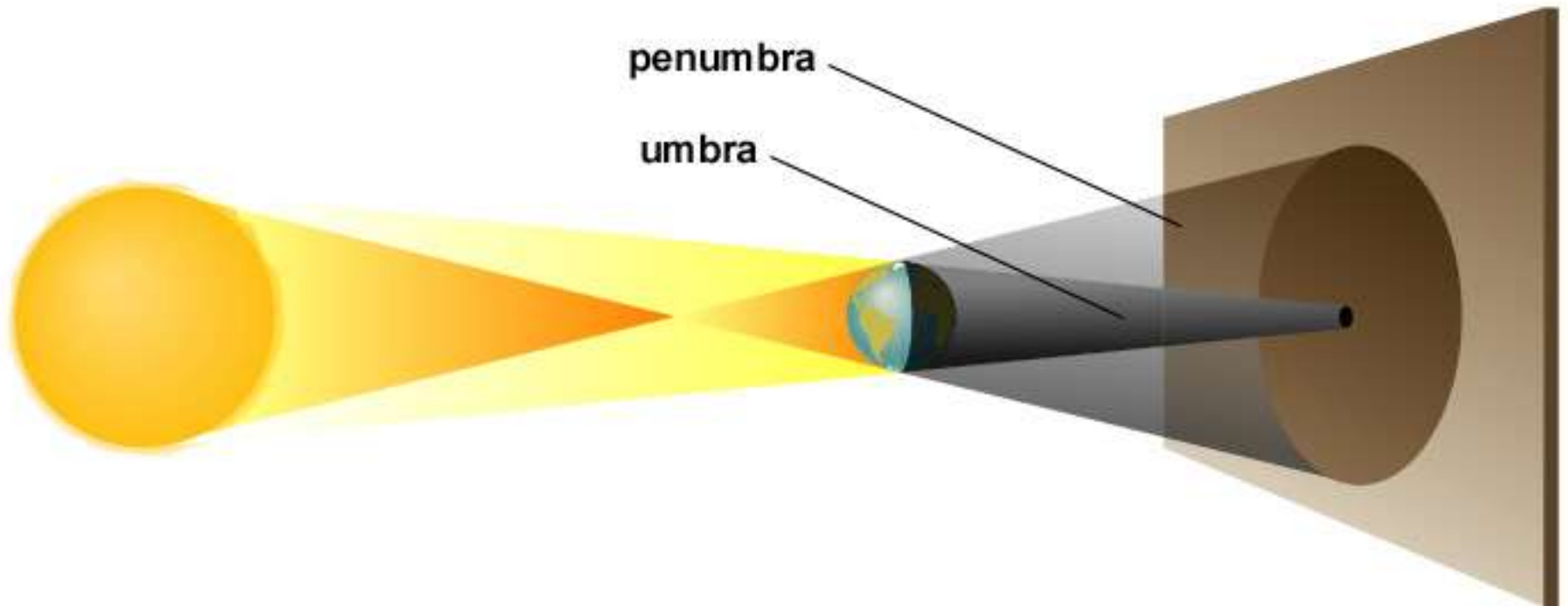
Planets and other Heavenly bodies

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# SUN

- **75% hydrogen and 25% helium by mass**
- **Sun converts hydrogen to helium in its core**
- **Differential rotation**
  - equator the surface rotates once every 25.4 days
  - near the poles it's as much as 36 days
- **Core conditions**
  - temperature is 15.6 million Kelvin
  - pressure is 250 billion atmospheres

# Umbra and Penumbra



# ***solar system***

**is made up of eight planets and numerous other objects that orbit the sun, all held in place by the sun's immense gravity.**

# Astronomical Unit

- Used in measuring vast distances in space.
- Equals to 150 million kilometer.
- 1 light year =  $9.4605284 \times 10^{12}$  kilometers

# Question!!!

The planets in the solar system  
revolve around the sun in  
elliptical orbits?



# Inner Planets

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## Terrestrial Planet/ Rocky

- Mercury
- Venus
- Earth
- Mars



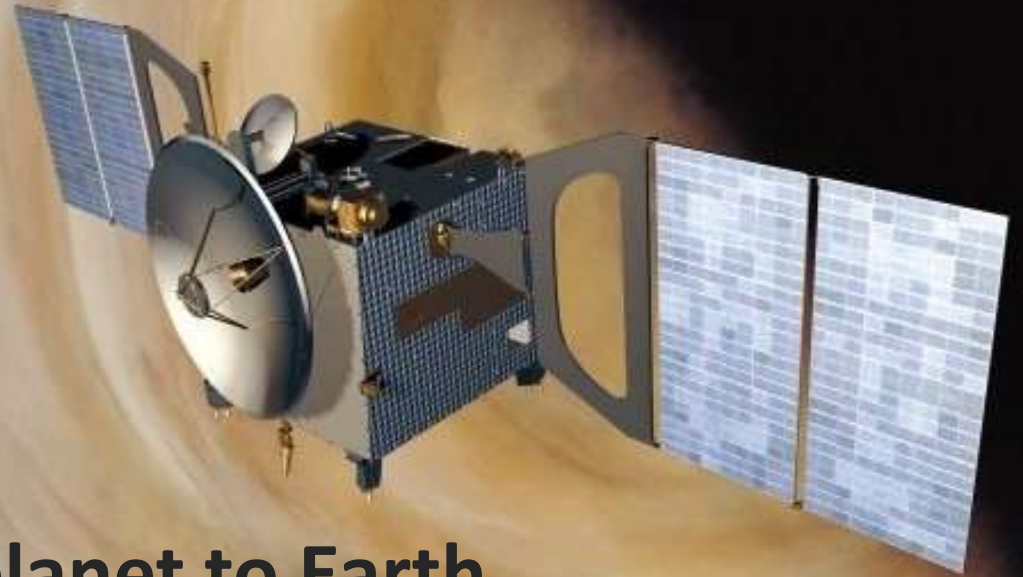
# MERCURY

- Planet nearest the sun
- Second smallest planet
- Covered with craters
- Has no moons or rings
- About size of Earth's moon





# Venus



- Sister planet to Earth
- Has no moons or rings
- Hot, thick atmosphere
- Brightest object in sky besides sun and moon (looks like bright star)
- Covered with craters, volcanoes, and mountains

# Earth



- **Third planet from sun**
- **Only planet known to have life and liquid water**
- **Atmosphere composed of composed of Nitrogen (78%), Oxygen (21%), and other gases (1%).**

# Mars

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- Fourth planet from sun
- Appears as bright reddish color in the night sky
- Surface features volcanoes and huge dust storms
- Has 2 moons: Phobos and Deimos



# Outer Planets

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## Jovian Planet/ Gas

- Jupiter
- Saturn
- Uranus
- Neptune





# ASTEROID BELT

-is the region of the Solar System located roughly between the orbits of the planets Mars and Jupiter.

It is occupied by numerous irregularly shaped bodies called asteroids or minor planets.

The asteroid belt region is also termed the **main asteroid belt** or **main belt** because there are other asteroids in the solar system such as near-Earth asteroids and trojan asteroids.

# Jupiter

- Largest planet in solar system
- Brightest planet in sky
- 60+ moons, 5 visible from Earth
- Strong magnetic field
- Giant red spot
- Rings have 3 parts: Halo Ring, Main Ring, Gossamer Ring





# SATURN



- 6<sup>th</sup> planet from sun
- Beautiful set of rings
- 31 moons
- Largest moon, Titan,
- Easily visible in the night sky
- Voyager explored Saturn and its rings.

# Uranus

- 7<sup>th</sup> planet from sun
- Has a faint ring system
- 27 known moons
- Covered with clouds
- Uranus sits on its side with the north and south poles sticking out the sides.



# Neptune

- 8<sup>th</sup> planet from sun
- Great Dark Spot thought to be a hole, similar to the hole in the ozone layer on Earth
- Discovered through math
  - 7 known moons
  - Triton largest moon
- The blue coloration of Neptune is probably due to the presence of methane



# Pluto

- 9<sup>th</sup> planet from sun (usually)
- Never visited by spacecraft
- Orbits very slowly
- Moon, Charon, is very close to Pluto and about the same size

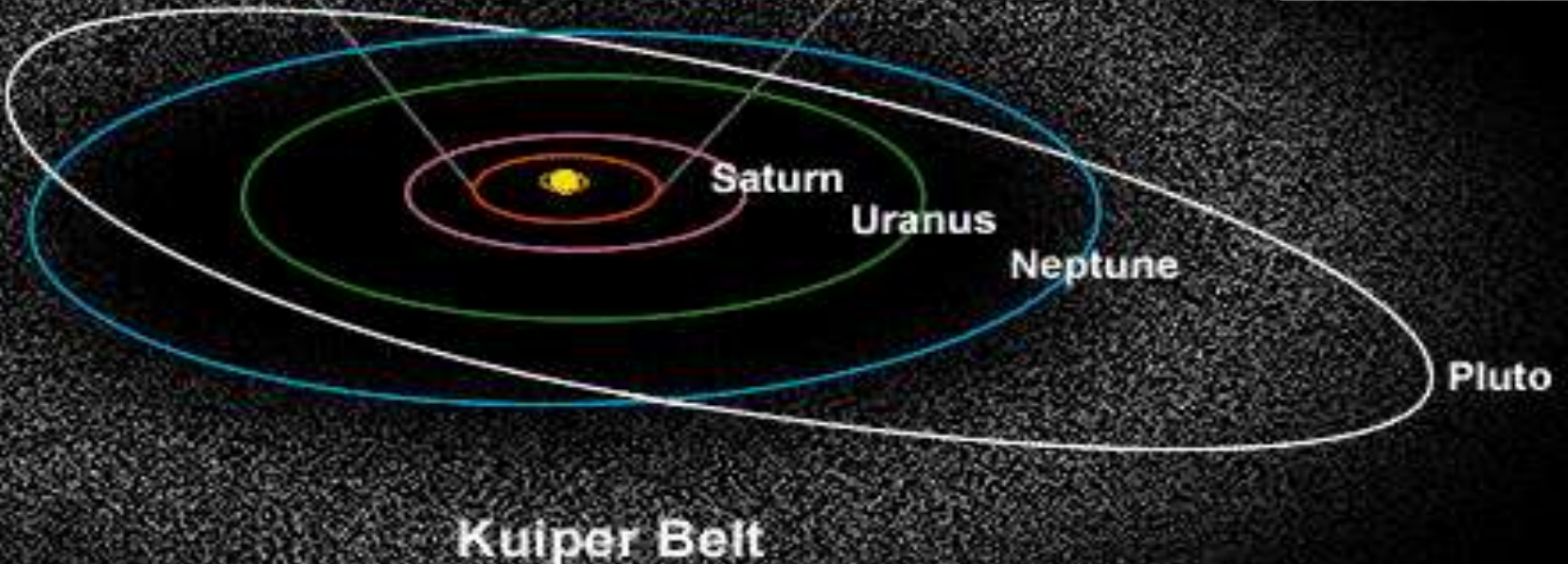
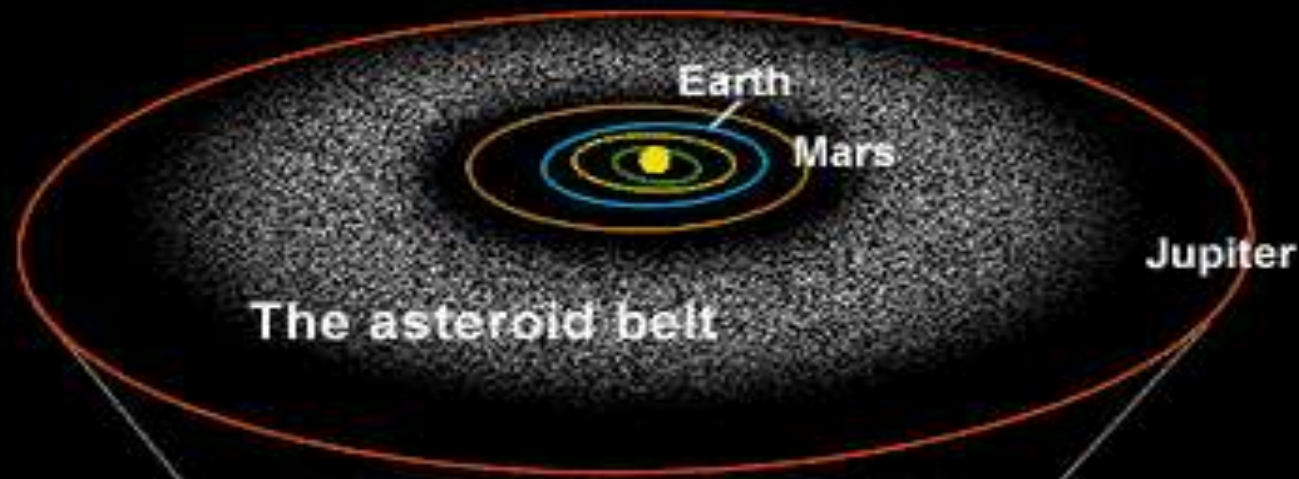




POOR  
PLUTO



**INNER SOLAR SYSTEM, plus Jupiter**  
(Orbits enlarged)



**DAWN TIMELINE**

- Leave Earth:  
September 2007
- Arrive at Vesta:  
September 2011
- Observe Vesta  
until April 2012
- Arrive at Ceres:  
February 2015
- Observe Ceres  
until July 2015



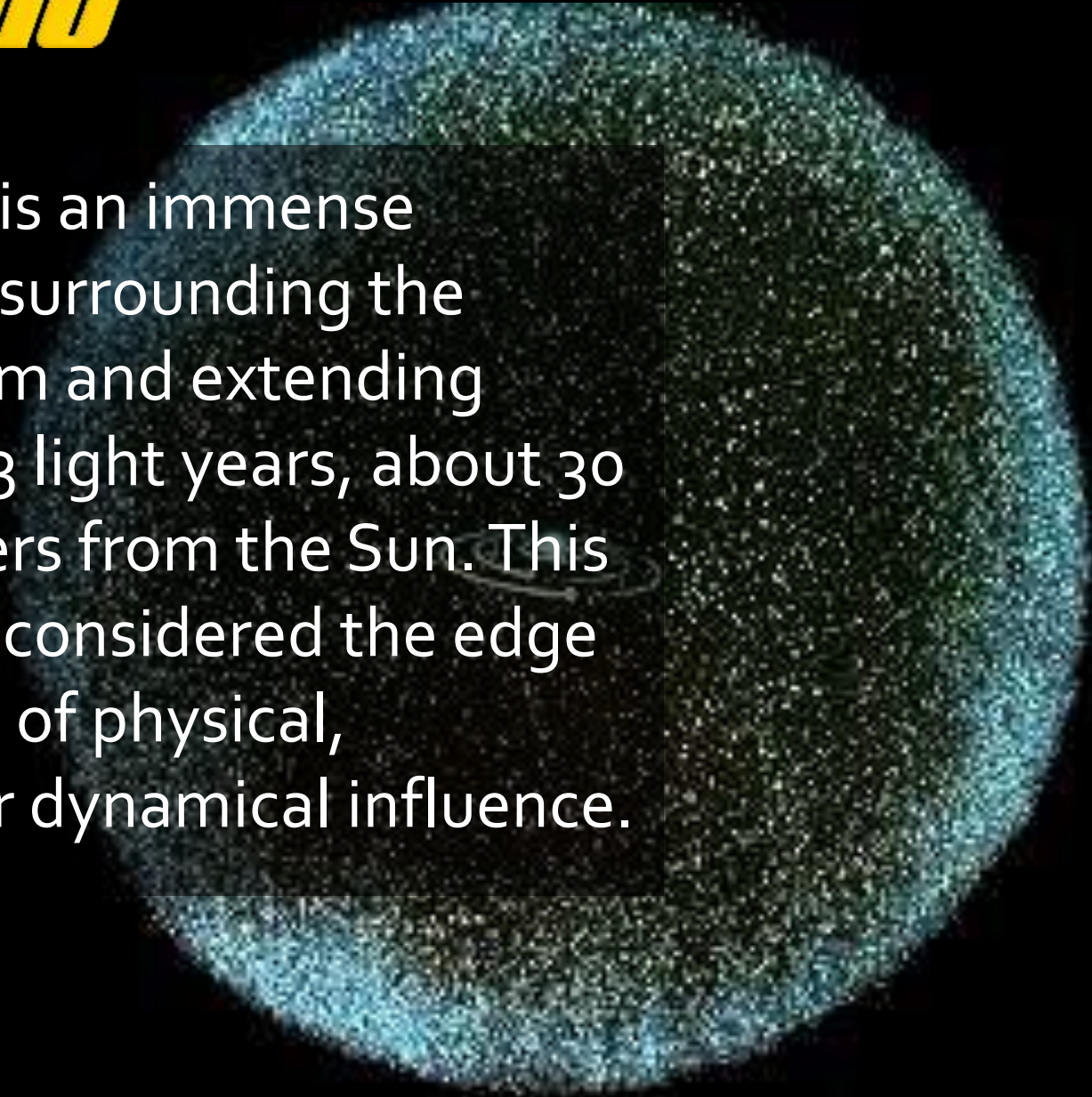
# Kuiper Belt

- sometimes called the **Edgeworth–Kuiper belt**, is a region of the Solar System beyond the planets extending from the orbit of Neptune
- While the asteroid belt is composed primarily of rock and metal, the Kuiper objects are composed largely of frozen volatiles (termed "ices"), such as methane, ammonia and water.

# *Oort cloud*

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- The Oort cloud is an immense spherical cloud surrounding the planetary system and extending approximately 3 light years, about 30 trillion kilometers from the Sun. This vast distance is considered the edge of the Sun's orb of physical, gravitational, or dynamical influence.





# Asteroids

A large, dark, irregularly shaped asteroid with a bright, glowing red-orange base, floating in space above a blue and white planet. The asteroid is the central focus, with its surface showing some texture and a prominent bright area at the bottom. The planet below is partially visible, showing blue oceans and white clouds. The background is a dark, starry space.

- **Small bodies**
- **Believed to be left over from the beginning of the solar system billions of years ago**
- **100,000 asteroids lie in belt between Mars and Jupiter**
- **Largest asteroids have been given names**

# Comets

A photograph of a comet streaking across a starry night sky. The comet is a bright, elongated object with a visible tail, moving from the upper left towards the center. The background is a dark, star-filled sky. In the foreground, there is a dark landscape with a barn and trees, illuminated by a soft, reddish light, possibly from a sunset or sunrise.

- **Small icy bodies**
- **Travel past the Sun**
- **Give off gas and dust as they pass by**



# *meteoroid*, METEOR, *meteorite*

- ***Meteoroid*** - the object in space
- ***Meteor*** - If there is something running through space, which could run into the Earth and produce a meteor (the streak of light produced by its rapid passage through the atmosphere)
- ***Meteorite*** – in event that part of it reaches the surface of the Earth and is picked up and studied