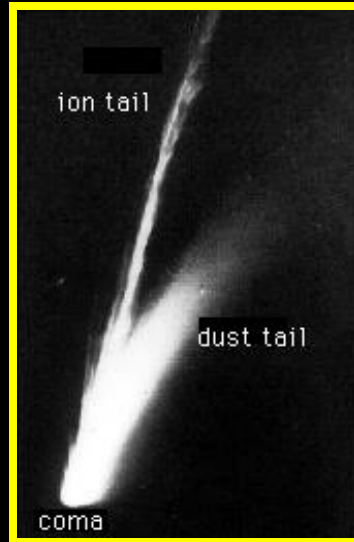


Comets, Asteroids, Meteoroids,

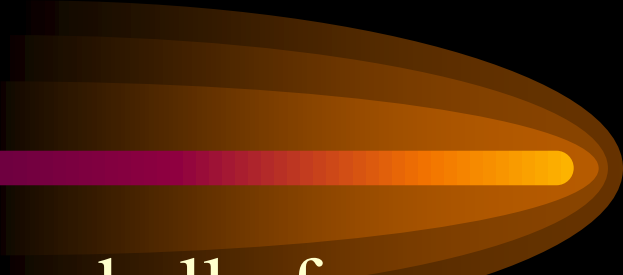


Comets.. 48) Dirty snowballs



- They look like a star with a ghostly white tail.
- A comet is a frozen ball of gases and liquids with small amounts of rock.



- 
- 46) What is a comet? A frozen ball of gases and liquids with small amounts of rock.
 - 47) Comets are chunks of ice and dust that revolve around the sun with very elliptical orbits.

Other pictures of Comets


Comet Hale-Bopp



**Comet
Ikeya-Seki**



**Comet
Kohoutek**



49) *The tails of comets always point away from the sun because the sun's radiation slowly burns away some of the comet as it orbits the sun.*

Comets orbit




- If a comet has a large orbit, it takes a long time to go around the Sun.
 - Some comets are "short-period" comets that take five or ten years to complete an orbit.
 - Some comets are "long-period" comets that take decades, centuries, or millenia to orbit the Sun.

How did comets form???????

- Astronomers are not certain how comets formed, but most believe that comets formed at the same time our solar system did, perhaps even in among the planets.

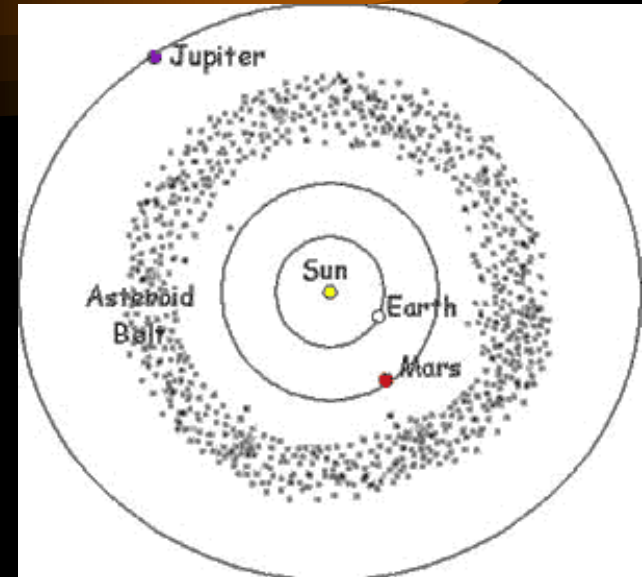





45) *Comets and asteroids are objects smaller than planets that orbit the sun and vary in size, composition, and characteristics.*

Asteroids

- Rock larger than a boulder revolving around the Sun.
- Orbits are mainly between Mars and Jupiter.
- Diameters are typically between one to several hundred kilometers.
- To the right are some compared to the size of our Moon.

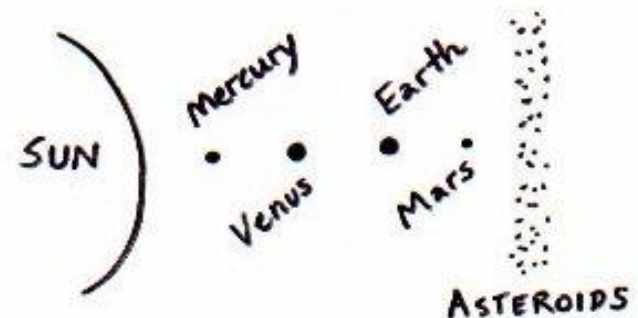


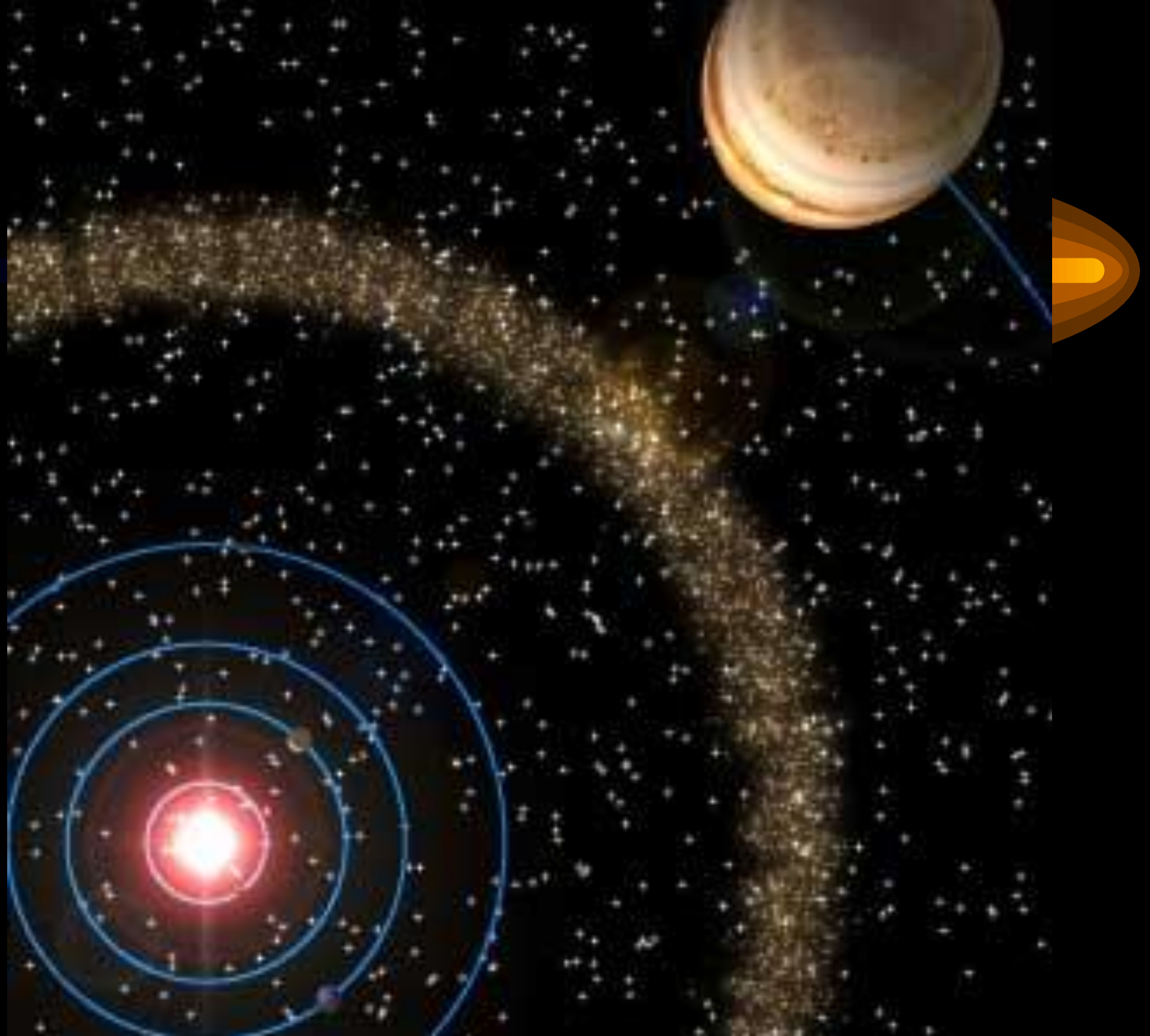
- 
- 50) Asteroids are smaller than planets and can be found orbiting the Sun.

Asteroids.....Rockin' Around

- Most asteroids travel in the wide gap between the inner planets and outer planets (known as 51 & 52 first blank) Asteroid belt).
- But a few travel in paths across Mar's orbit and some even cross in Earth's orbit.

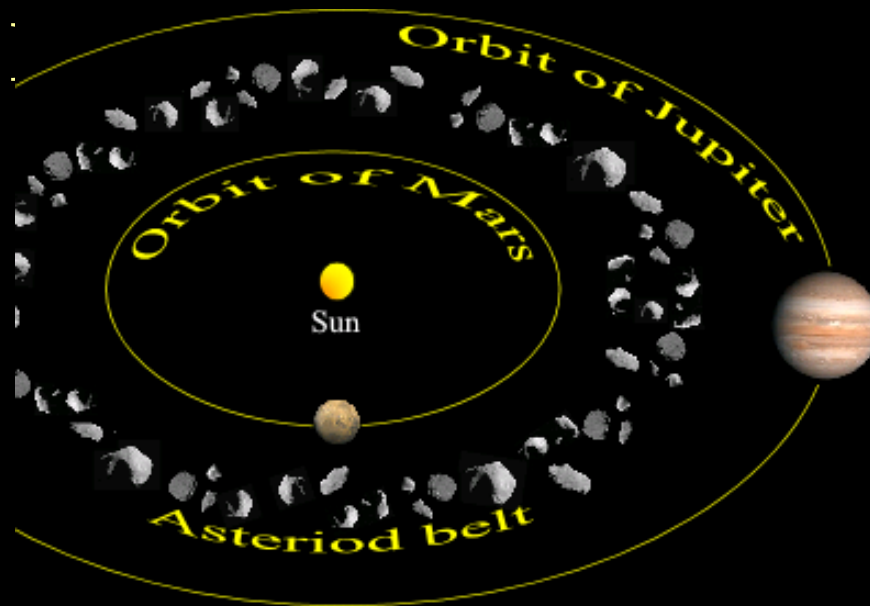
Asteroid distribution





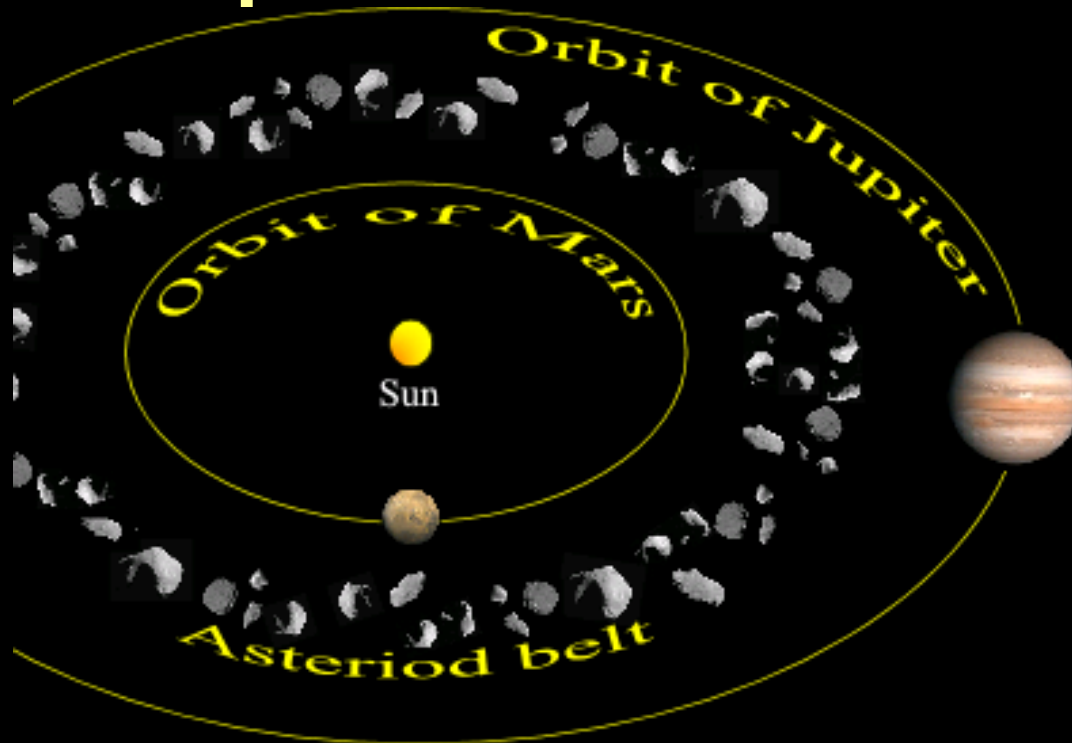
Asteroid Belt

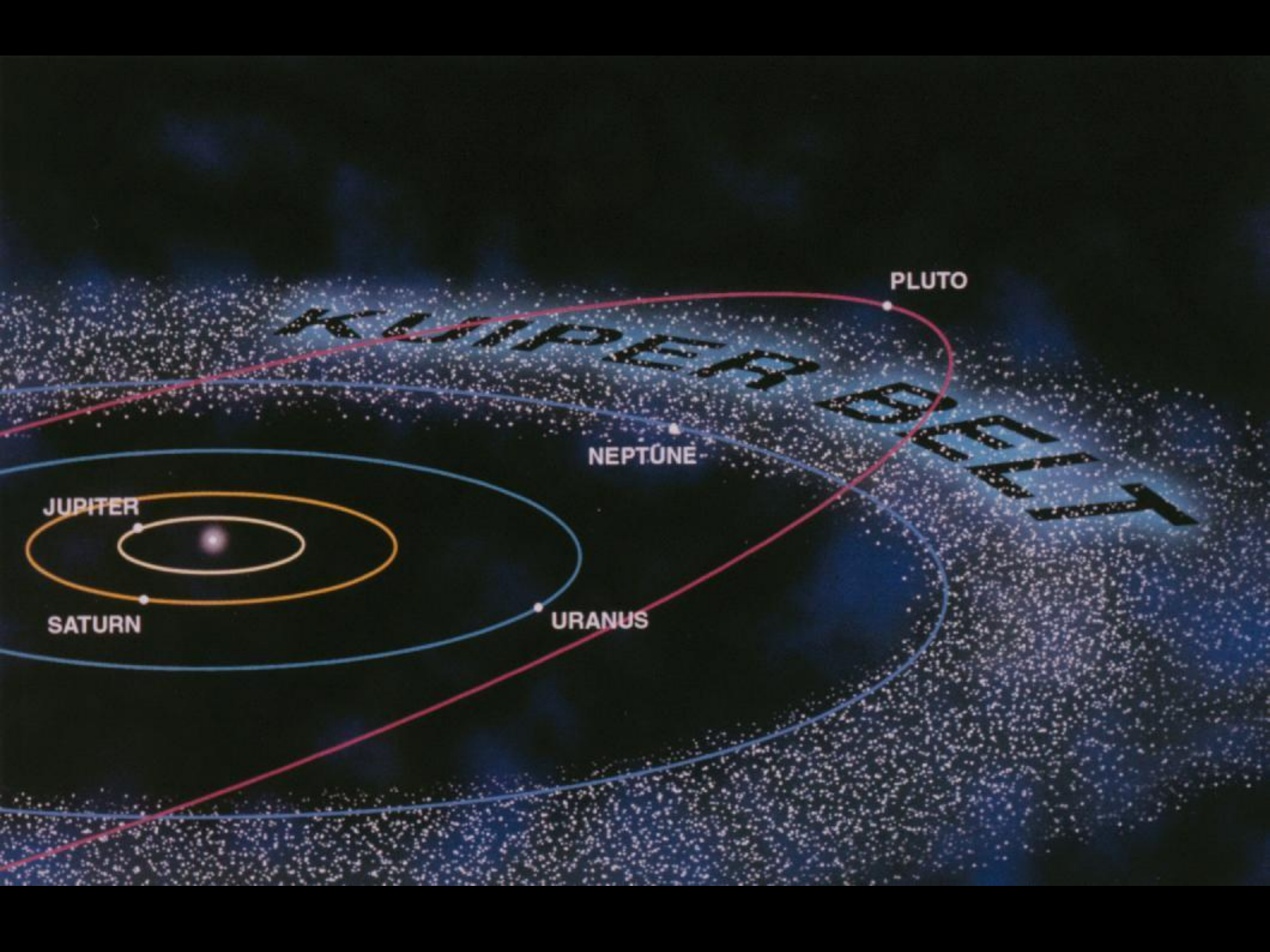
- The region of space between Mars and Jupiter; about 2.8AU
- Hundreds of thousands of asteroids known.



Asteroid Belt

- Asteroids are remnants of a planet-formation process that failed





JUPITER

SATURN

NEPTUNE

URANUS

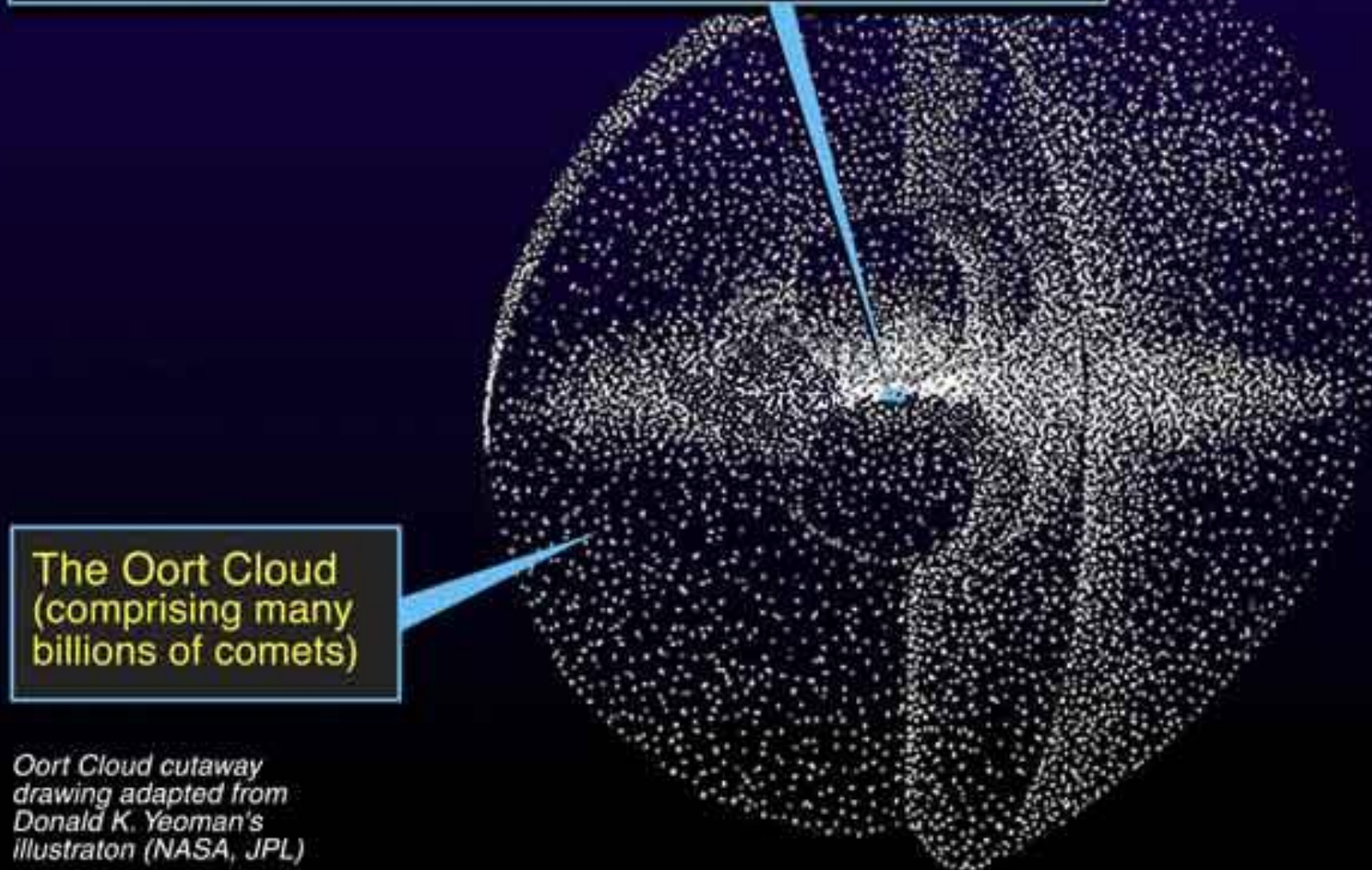
PLUTO

KUIPER BELT

Second blank 52) Kuiper Belt

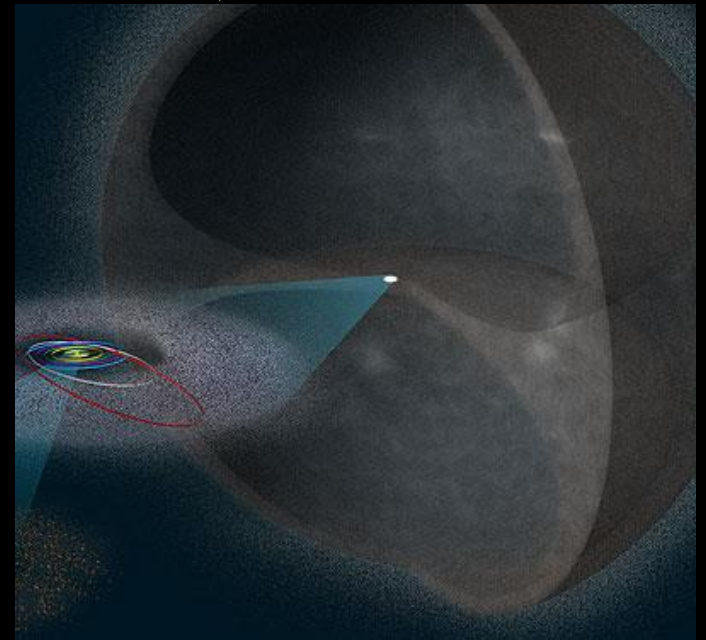
- **Discovered in 1992**





52) Oort Cloud

- **Hypothetical spherical cloud. No direct observations.**
- **Proposed by Ernst Opik (1932), Jan Henrik Oort (1950)**



Meteoroids, Meteors and Meteorites

- **Meteoroid** = the object before it enters Earth's atmosphere. Most are destroyed about 80 km above the Earth's surface. They are small sand to boulder-sized particles of space debris.
- **Meteor** = They are often called shooting stars. We see them as glowing small particles as they enter the atmosphere. They glow because of heat from friction with the atmosphere.
- **Meteorites** = They are rocks that reach the Earth's surface from space.



Meteoroid



Meteor

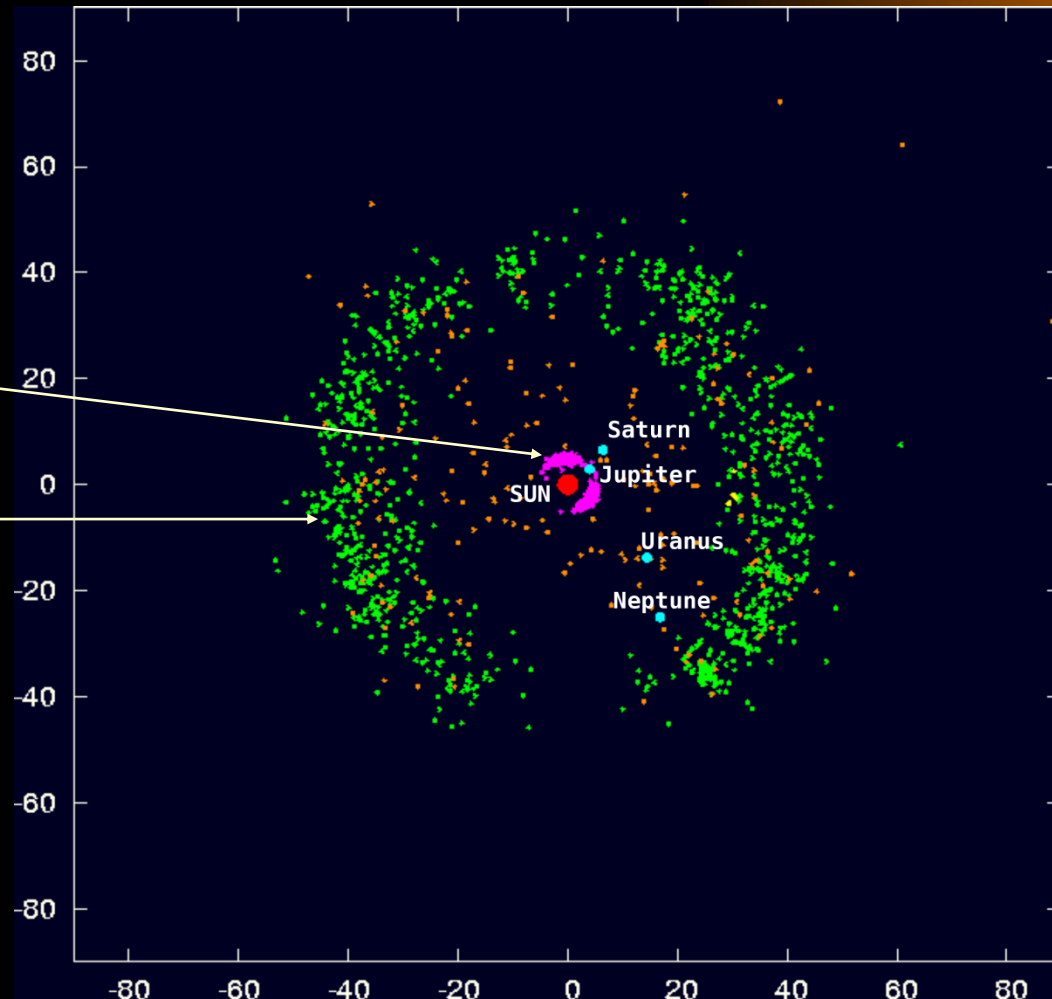


Meteorites

Other asteroids lie on the outer edge of our solar system in the Kuiper Belt


In this picture
you can see
the Asteroid
Belt

And the
Kuiper Belt



Asteroids have impacted Earth





53) Scientists suggest that the last massive asteroid that hit Earth landed approximately 65 million years ago.

*Based on past asteroid activity, when is
the next massive asteroid due to hit
Earth?*



The next major asteroid should have hit Earth approximately 15 million years ago, because scientist believe the massive asteroids hit Earth every 50 million years.

Meteoroids, Meteors and Meteorites

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Meteoroid



Meteor



Meteorites

Meteors...Shooting Stars or Space Garbage

- 56) A meteor is a small rock flying through Earth's atmosphere.



Meteors...Shooting Stars or Space Garbage

Meteors are falling all the time.

During the annual meteor storms, you may see 100 per hour.



Why does a meteor glow?

- The small rock burns as it fly's through the atmosphere.
- REALLY bright meteors are called
FIREBALLS




Meteoroid

- A small rock flying through space




- A small rock that landed on Earth from outer space





54)Based on past asteroid activity, when is the next massive asteroid due to hit Earth? The next major asteroid should have hit Earth approximately 15 million years ago. We are overdue.

55)Meteoroids are a chunk of rock or dust found in space, and usually come from a comet or asteroid.

- 
- 56) A meteor is small rock flying through Earth's atmosphere, a meteoroid is a small rock flying through space, and a meteorite is a small rock that landed on Earth from outer space.
 - 57) Why does a meteor glow? The small rock burns as it flies through the atmosphere.

What's That Up In The Sky???

<u>COMETS</u>	<u>ASTEROIDS</u>	<u>METEORS</u>
Made of ice- have tails	Made of rock and metal	Made of rock and metal
Stay in space	Stay in space	Fall into Earth's atmosphere
Orbit the sun	Orbit the sun	Gravity pulls to Earth; they burn up as they fall

So, what have we learned



- What are comets?
- Where are they usually located?
- What are Meteoroids, Meteors, and Meteorites?
- What are Asteroids?
- Name three places where we can find asteroids?