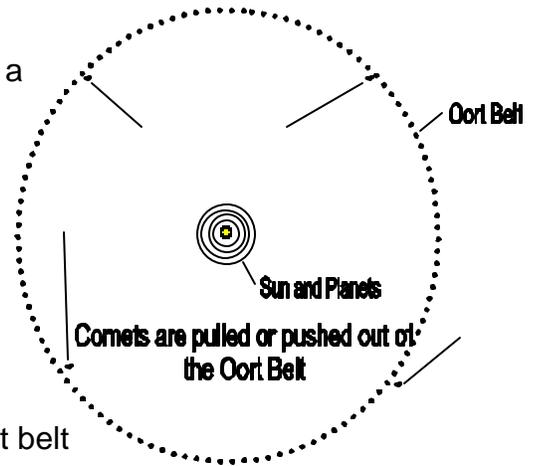
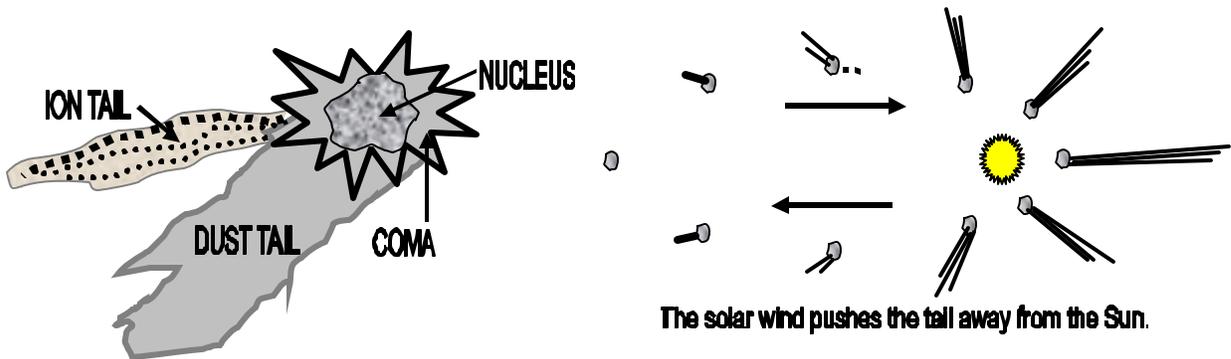


ACTIVITY 1 - Make Your Own Comet

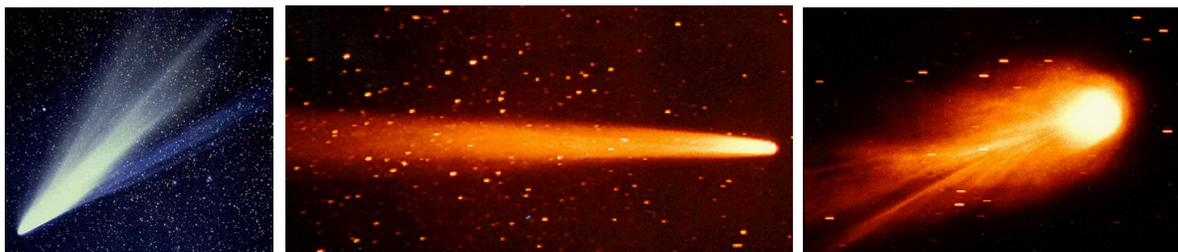
Dutch astronomer James Oort theorized that **comets** must exist in a very large shell forming a sphere around the solar system. He estimated that this sphere starts at a distance of **6,975,000,000,000 miles** away from the Sun (That's 75,000 times farther away from the Sun than the Earth is from the Sun). This sphere has become known as the "**Oort Belt**"



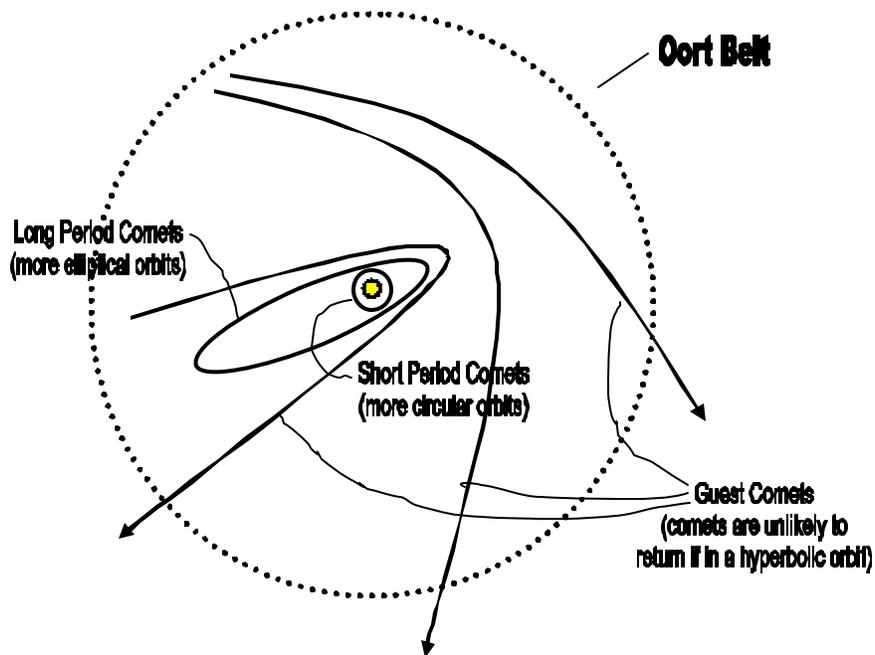
Probably made from frozen volatile debris leftover from the formation of the solar system, comets may be gravitationally tugged out of the Oort belt by nearby passing stars, or pushed out by exploding stars known as "supernova." A few of these comets, often described as "**dirty snowballs**," are sent hurling toward the center of the solar system and may even be trapped in an orbit around the Sun. As the comet approaches the Sun, the Sun's heat causes the comet to "melt," The melting comet starts to disintegrate forming a cloudlike "**coma**" and a "**tail**" around the frozen "**nucleus**" of the comet. The coma and tail get bigger and bigger as the comet gets closer and closer to the hot Sun. The tail is a very fine gas mixed with dust and sand sized particles once frozen within the comet nucleus.. The tail has a very low density and always points away from the Sun due to the outward push of a "**solar wind**" originating from the surface of the Sun. Charged particles in the solar wind sometimes interact with particles in the tail of the comet to form a secondary "**ionic tail**."



Identify the **Nucleus**, **Coma**, **Dust Tail** and **Ion Tail** (if it exists) in each of the photographs of comets shown below.



A comet that is gravitationally tugged out of the Oort Belt and sent toward the Sun may visit our part of the solar system just once and then continue on its journey past the Sun and back out of the solar system, never to return again. Some comets get close enough to the Sun so that they get trapped in one of several orbital shapes. The shape of the orbit will determine how frequently the comet will return to the inner circle of the orbiting planets and be seen by Earth observers. Comets that travel in **circular to elliptical orbits** are **short period comets** and may be seen several times in a human life time. If the orbit has a wide open shape like that of a parabola, it will have a **long period** of orbit and may never be seen in a given lifetime.



Halley's Comet is an example of a **long period comet** travelling in an **elliptical orbit** that takes it beyond the orbit of the planet Jupiter.

To make a model of a comet you will need the following materials and tools:

- Ice Crusher or Blender
- 6 ice cubes
- 4 tablespoons of sand

Crush the 6 ice cubes in the crusher or blender until you get a snowball like consistency. Mix the 4 tablespoons of sand into the crushed ice and pack the mixture together as if forming a "dirty snowball."

This may be simple, but this concoction gives you an idea of what the nucleus of a comet might look like.