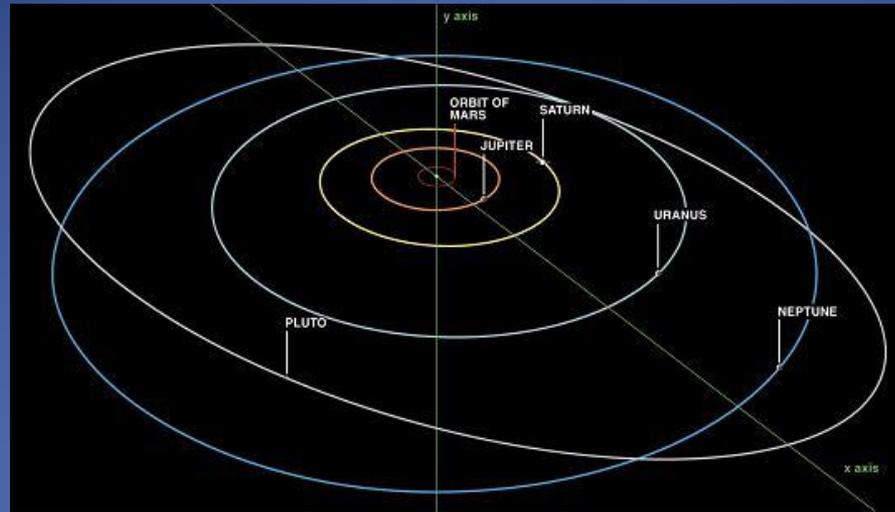


Big Bang Overview

- Nothing to everything
- Small singularity to indefinite expansion
- Evidence
 - Radiometric Dating
 - Background Radiation
 - Red Shifting and blue shifting
 - Quasars
 - Redshift and centers of new galaxies

Solar Nebula Theory



Formation of the Solar System

The Solar System formed from the collapse of a cloud of gas and dust.

The cloud was slowly rotating and formed a shape of a disk from centrifugal forces. This process moved matter to its centre

Conservation of Angular Momentum (...recall that...) made the rotation faster.

As well, the disk began rotating along one plane. This rotational pattern explains why most of the planets orbit in the same direction and along the same plane (see illustration).

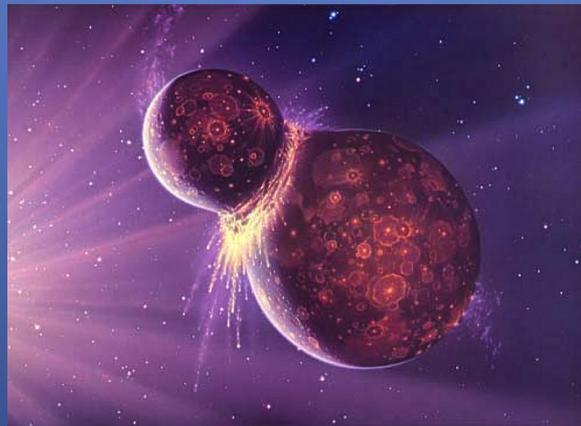
Solar Nebula Theory

Dust , rock and ice joined to make small planetesimal bodies

This is the start of planet building

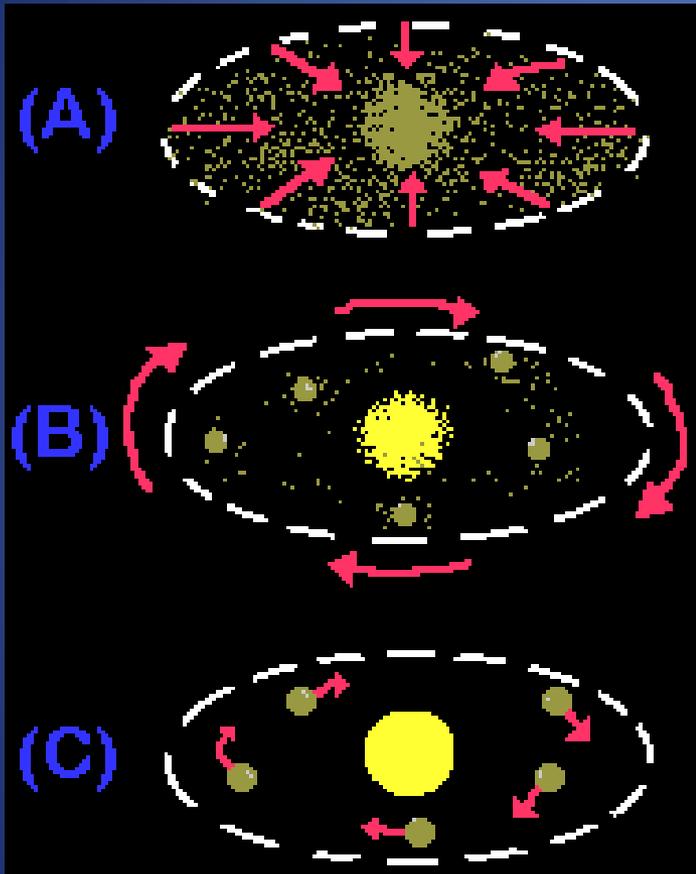
Via gravitational pull, larger planetesimals attract smaller ones. They collide and possibly merge to form larger bodies...eventually planets

The Sun is burning very hot. The heat prevents the formation of atmospheres in the closest planets.



Solar Nebulae Theory

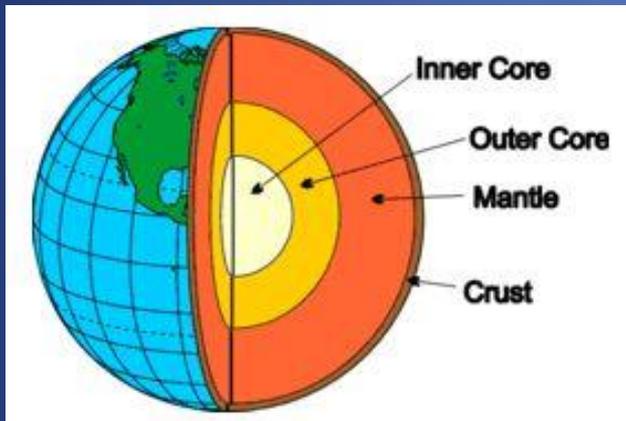
Modified, the new hypothesis states (1) a nebulae rotates and collapses to form a solar system, (2) instabilities cause dust particles to stick together (planetesimals), (3) these particles collide and form protoplanets, (4) the centre of the disk becomes so massive and hot it “turns on” (i.e., Sun) and (5) the Sun radiates energy that vaporizes dust in the inner Solar System.



Solar Nebula Theory

Formation of the Solar System...3

The planets are mostly liquid-like. Heavy elements start to sink, and as a result, radioactive elements are concentrated in the centre. NOTE: This explains the intense heat at the Earth's core AND gravitational energy.



On Earth, gases such as H_2S , SO_2 , CO_2 , H_2O , NH_3 and N_2 are released from the hot interior. These gases react with solar radiation to break apart and form rudimentary atmospheres.

This explains the Inner Planets which are terrestrial. How might the process differ for the Outer or Gas Planets?

Solar Nebula Theory

- The theory of how stars and solar systems formed
- Our solar system formed about 4.6 billion years ago.
- Radiometric Dating Explained:

All objects in the Solar System are about 4.6 billion years old. We know this from radioactive dating. For example, the Half-Life of U238 is 4.5 billion years.

Oldest Earth rocks at 3.96 billion years old.

If we radioactive date a planet, we are actually looking at the time the mass solidified. Thus, the Solar System is much older than 4.6 billion years

