FORMATION OF EARTH AND ITS SOLAR SYSTEM

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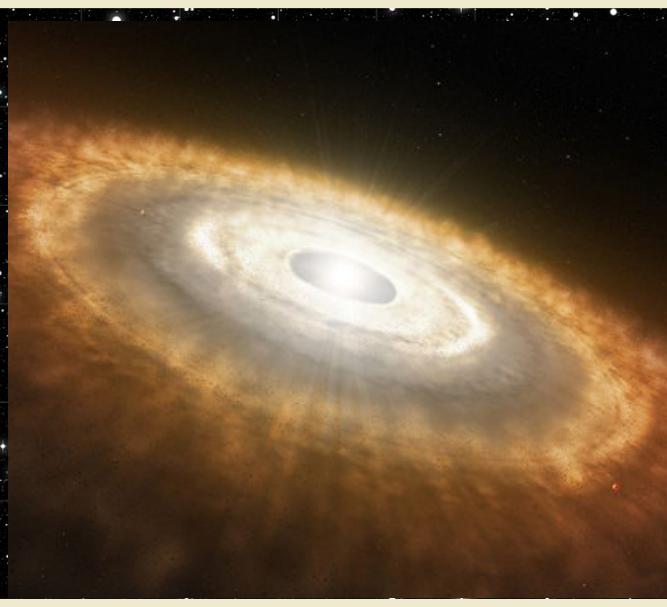
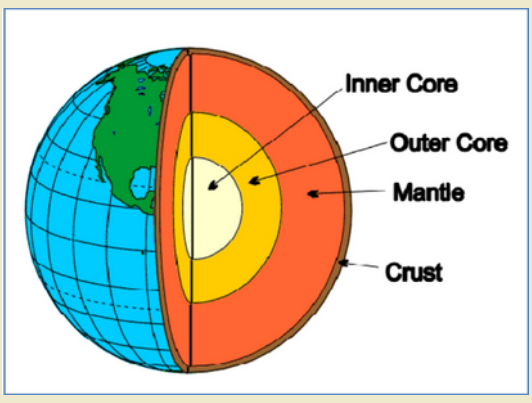
SOLAR NEBULA THEORY

- Begins with a cloud of dust and gas, likely leftover from a supernova
- This cloud of dust and gas begins to collapse and condense into a disk
- The Sun, before it was the Sun, collected the most of this dust and gas and formed in the middle of the disk
- The rest of the planets were also formed from this disk of dust and gas but were much smaller than the Sun
- Inner plants tended to be more rocky, while outer planets tended to be more gaseous.



DIFFERENTIATION OF THE EARTH:

THE ORGANIZATION OF EARTH INTO LAYERS



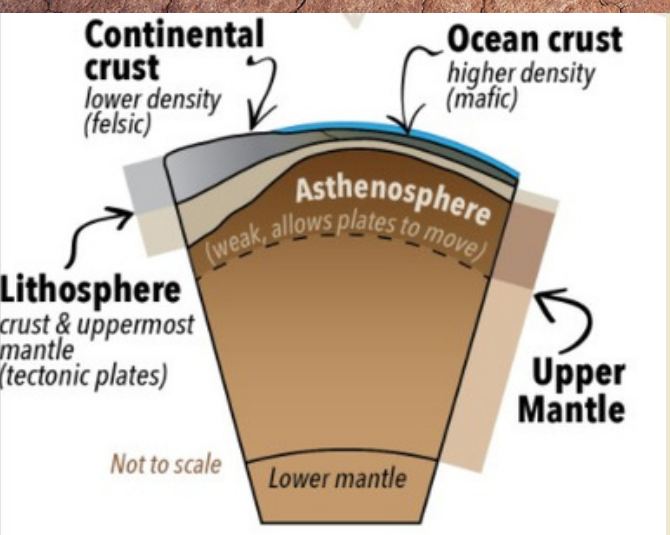
How This Happened In Steps:

1) Earth heats up due to radioactive decay, gravitational compression, and meteor impacts
2) Earth's interior temperature reaches the melting point of Iron
3) The melted Iron then sinks toward the Earth's core due to gravity while conversely the lighter materials from the Earth begin to relocate toward the surface

This process resulted in the formation of the crust, mantle, and core.

THE CRUST

- Earth's outermost and lightest layer
- Consists of about 40% continental crust (20-80 km deep) and about 60% of oceanic crust (~8 km deep)
- Radioactive elements are concentrated in the crust which helps in the releasing of heat from the crust
- Forms the lithosphere in combination with the upper mantle



THE MANTLE

- Layer of silicate rock between the crust and outer core
- Primarily composed of the silicate Peridotite
- Has a solid upper and lower mantle
- In between the solid lower and upper mantles is the asthenosphere, a highly viscous, and weak region.

THE CORE

- Contains two parts: an inner core and an outer core
- Made primarily out of iron with a hint of nickel, due to differentiation as outlined above
- The inner core is completely solid due to pressure and density and is small in size
- The outer core is completely liquid and separates the inner core from the rest of the planet.
- This causes the inner core to rotate slightly faster than the rest of Earth