

Solar System has 4 main

- ① Sun
- ② Terrestrial (Inner)
- ③ Jovian (outer)
- ④ Cyper Belt and Oort Cloud

- most planets evolve around the sun on a common plane
Same spin as the sun.

* Composition of the Planets: (landed only on Mars and Venus)

info. has come indirectly - observational

- density = mass / volume \rightarrow volume $\propto r^3$ mass = gravitational interactions
= used to ascertain a planet's composition

volume = measured by determining the radius of the planet
from its angular size and distance

- in order to use density compare it = problems

DENSITY = Earth = 5.5 grams per cubic cm

look @ spectral lights

can look @

- Extremely larger planets - Saturn and Jupiter - density can change. Compressed = Gases; some solids

- No one knows exactly what's in these planets - probably all formed in same way - collisions, gases, rock,
- Planetesimal - planets started

- Solar System flat all planets orbiting the sun
- Terrestrial (no hydrogen/helium)
- Jovian - more like the sun
- All bodies appear to be 4.5 billion yrs. old or younger

* Solar Nebula Hypothesis (Kant and Laplace = 1730's)

proposed a flattened disk formed from an interstellar cloud - a very large rotating cloud of gas and dust and the raw material of star forming systems. Interstellar clouds are quite common.

One interstellar star is about a few light years in diameter and about twice the ~~mass~~ mass of the sun.

- mostly hydrogen (71%) and helium (27%) and a smattering of other gaseous elements.

- also contain very tiny (a few molecules in size) dust particles known as interstellar grains.

Interstellar grains = made of silicates, iron compounds, carbon compounds, and ice.

- Spectral lines from starlight coming through interstellar clouds yields to composition. ABSORPTION SPECTRUM
- Older meteorites have interstellar grains
- Gravity eventually causes the cloud to collapse and conservation of angular momentum causes it to rotate faster.
- Conservation of angular momentum = why big clouds to rotate. (slow)
- Solar Nebula = disk w/ bulge in the center
- Cloud collapse occurred over a few million years and became a rotating disk w/ a bulge in the center → Solar nebula (Disk became the planets - bulge became the sun)

- Solar nebula = 200 AU in diameter
10 AU thick

* Inner parts heated by sun - outer parts = cold.

- Condensation occurred as substances cooled to their liquid or solid states.
- Accretion and early planetesimal formation via gravitational accretion. Gas giants may form directly w/out going through a planetesimal stage. no collisions (form directly from solar nebula)
- formation of moons = solar systems in miniature
- Accretion via collisions in planetismals.

Some planetismals remain to this day - Kuiper belt
asteroid belt between Mars and Jupiter - rocky planetismal
Oort cloud - icy planetismal known as comets.

- Atmosphere formation was the last stage in planet development
- Clean up of the solar system by collisions and solar wind

Prevents big objects to collide

Sweeping of solar system = already absorbed in other planets

Solar wind = charged particles streaming out from
the sun

- creates pressure - ability to move things from
inner to outer

- ① things just run into each other
- ② solar system

* Planets may migrate after formation =

may change its orbit

• happens w/ Jovian size planets

- cause destruction w/ earth size / type terrestrial planets