

## Observational Evidence in our Solar System

Class 4, Tuesday, January 18, 2011

- a) All the planets orbit in the same direction around the sun. (Contraction)
- b) (Nearly) all the planets rotate on their axis in the same counter-clockwise direction. (Contraction)
- c) The Sun rotates on its axis in the same counter-clockwise direction. (Contraction)
- d) All the planets orbit in the same flat, 2-Dimensional plane. (Contraction)
- e) All the planet orbits are virtually circular. (Contraction)
- f) The Sun is at the center and contains most of the mass of the solar system. (Contraction)
- g) The four inner 'Terrestrial Planets', Mercury, Venus, Earth, Mars, are rocky and small and dense. (Cond)
- h) The four inner Terrestrial Planets, have relatively low mass. (Condensation)
- i) The four outer 'Jovian Planets', Jupiter, Saturn, Uranus, Neptune, are gaseous, large and tenuous. (Accr)
- j) The four outer planets have relatively high mass (particularly Jupiter and Saturn). (Accretion)
- k) There is a belt of a few dwarf planets and lots of small bodies (all asteroids) lying between Mars and Jupiter with a total mass less than Mars and being made mostly of rock. (Cond/Accr)
- l) Pluto lies at an angle to the plane of the Solar system, and has an elongated (non-circular) orbit. (??)
- m) Venus rotates backwards on its axis. (?? – due to collisions after solar system formation)
- n) Uranus rotates on its side (like a rolling barrel). (Due to collisions after solar system formation)
- o) There is little debris between the planets, except the asteroid belt between Mars and Jupiter. (Clear)
- p) Out beyond Neptune, exists a very large number of small bodies (with a few dwarf planets, including Pluto & Eris) made of ices and rock, called the Kuiper Belt. (Cond/Accr)
- q) Icy small bodies, called comets, are seen to originate in the flattened Kuiper Belt OR a much further location, the spherically-shaped, Oort Cloud. They develop tails as they enter the inner solar system. (??)
- r) The chemical composition of the Sun is similar to Jupiter and Saturn. (Accr)
- s) Most major moons orbit in the same direction as their host planet and the solar system. (Contraction)
- t) Some moons orbit in the opposite direction as their host planet and the solar system. (post-formation collisions)
- u) The inner planets are relatively close to each other in orbit, while the outer planets are spread out from each other in orbit. (?? Dynamical.. post-accretion)