

# Planet Notes

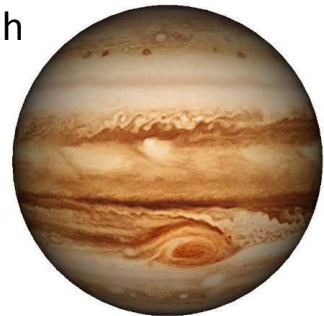
November 7

## • Major Planets:

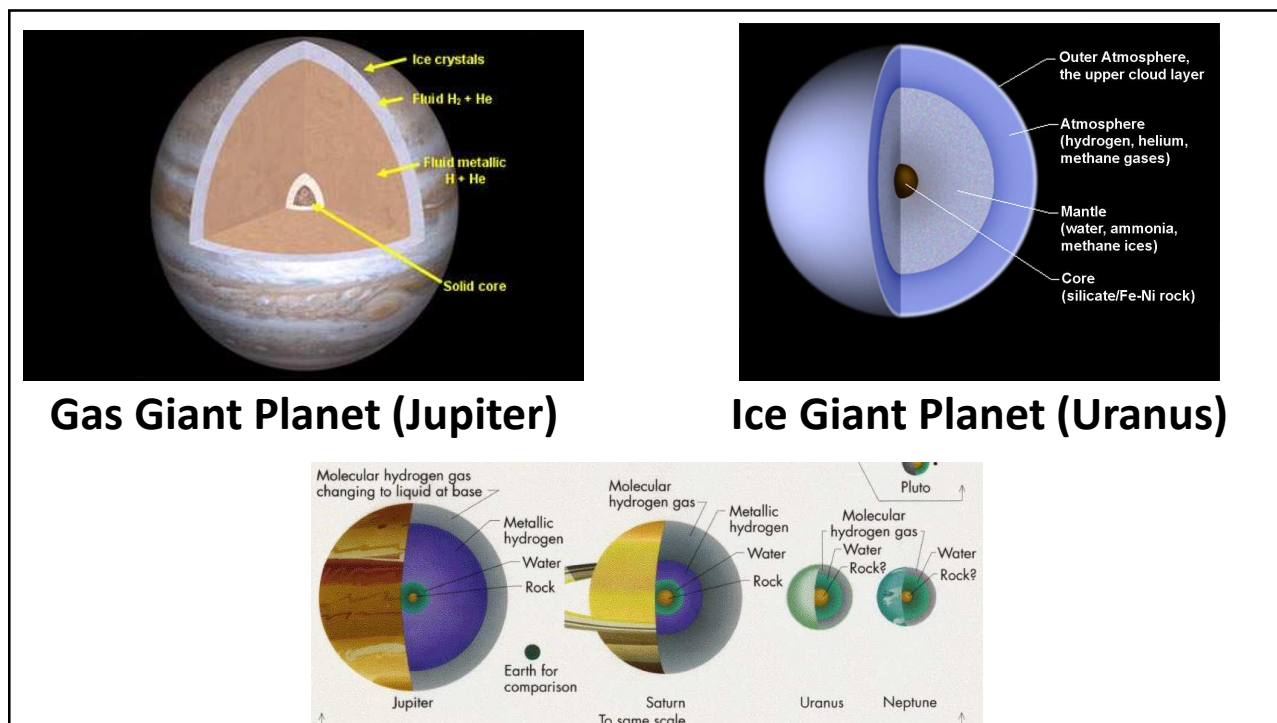
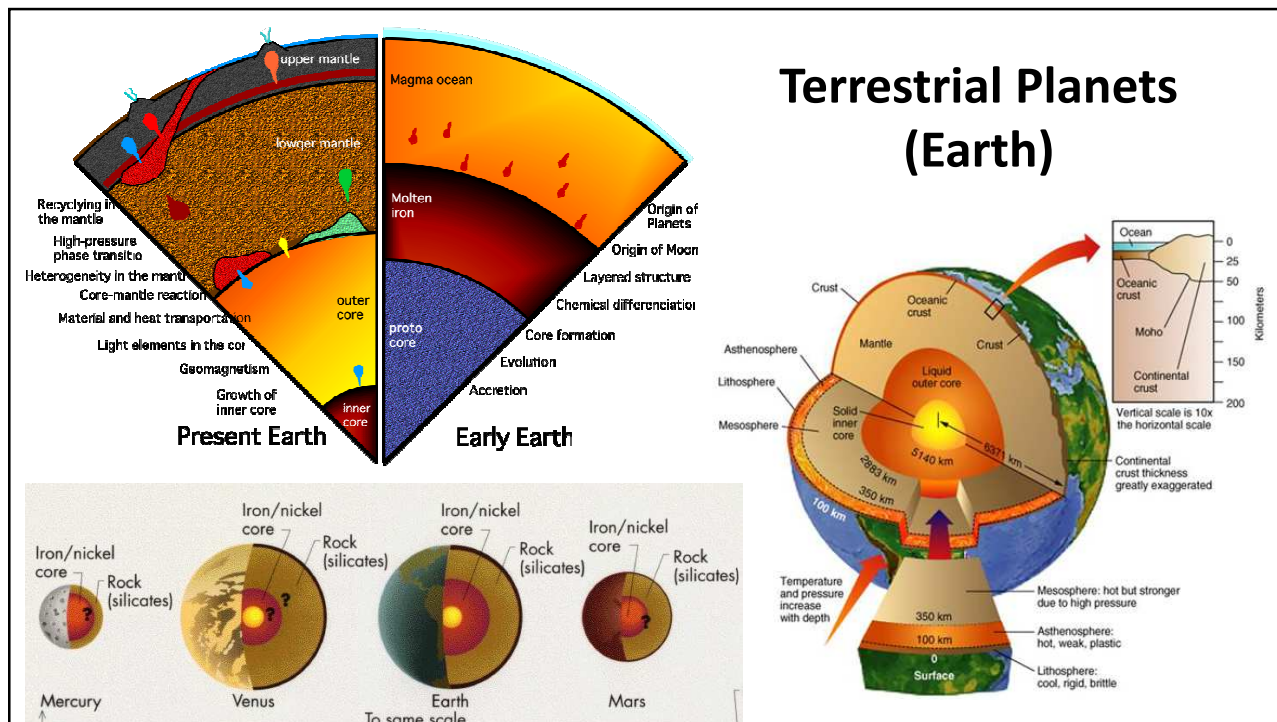
- Terrestrial Planets (rocky planets): planets made of mostly rock with iron/nickel metal cores (Mercury, Venus, Earth, Mars).



- Gas Giant Planets (Jovian planets): very large planets made mostly of gases (also liquids and ices) with possible rocky cores (Jupiter, Saturn, Uranus, Neptune)

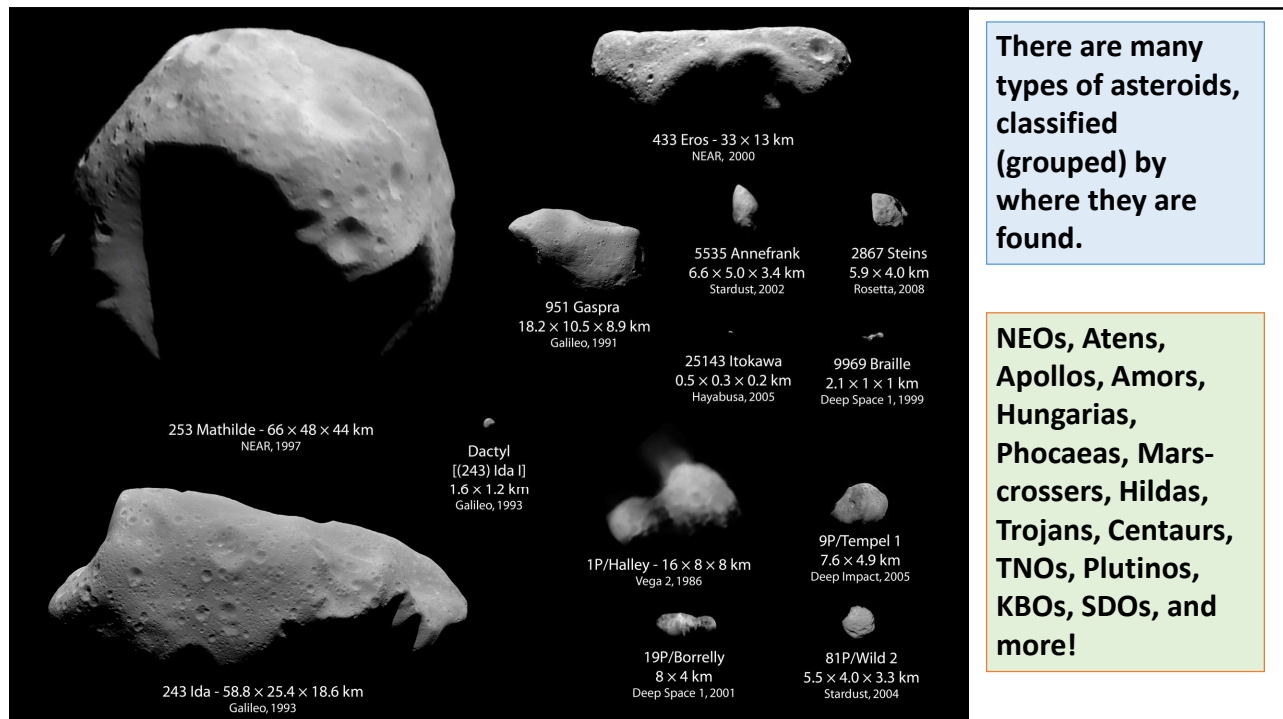


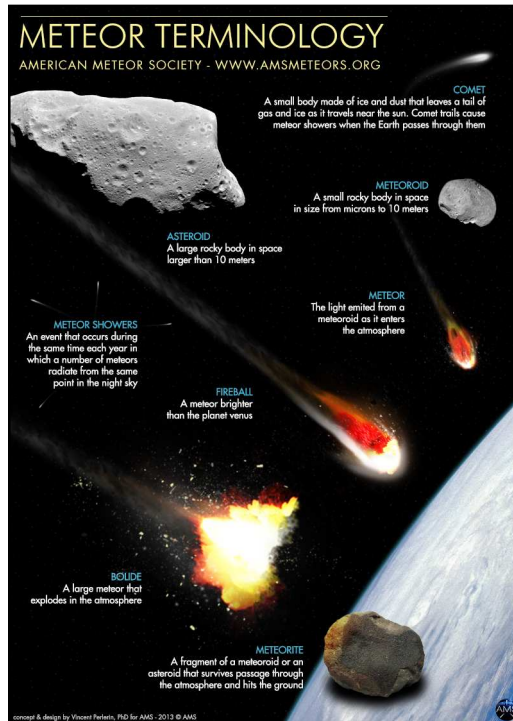
- Ice Giant Planets: smaller gas giants with high amounts of ices in their atmospheres (Uranus, Neptune)



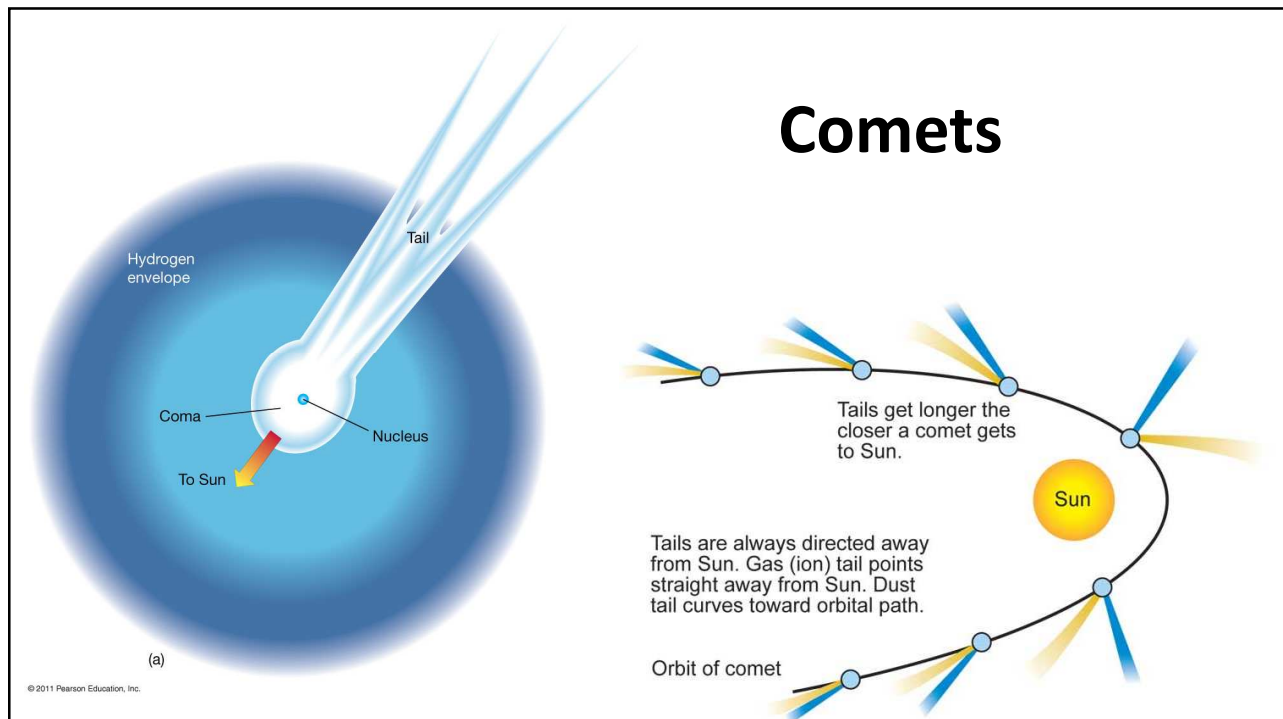
- **Minor Planets** (Small Solar System Bodies – SSSBs):

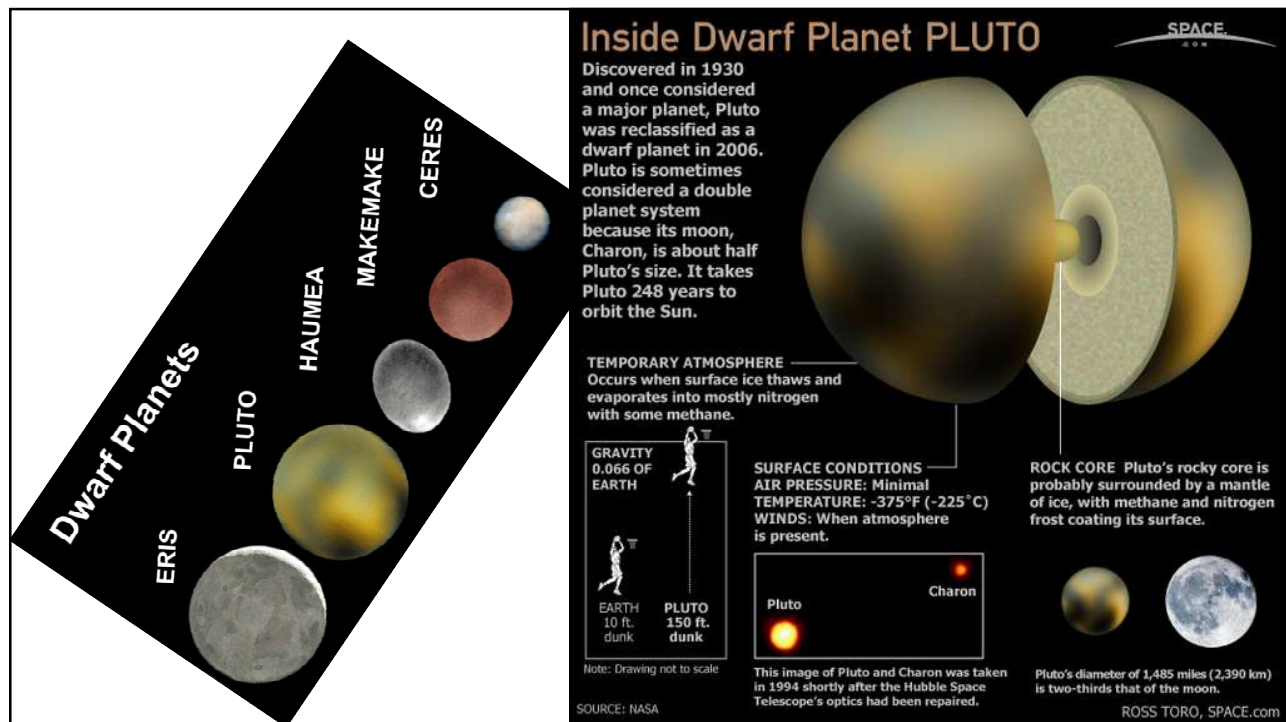
- **Asteroids**: small rocky and/or icy bodies orbiting Sun, up to 1,000 km across. Found all over Solar System, mostly in Asteroid Belt and Kuiper Belt.
- **Meteoroids**: Very small rocky/metallic chunks up to 10 m. Called meteors if enter Earth's atmosphere, meteorites if impact surface.
- **Comets**: small rocky/icy bodies (“dirty iceballs”) with long, strongly elliptical orbits, develop “tails” when approaching the Sun.
- **Dwarf Planets**: a small planet that is large enough have a spherical shape (through gravity) but not massive enough to clear it's own orbit of other bodies. (Ceres, Pluto, Haumea, Makemake, Eris)





- Meteoroids can be fragments of asteroids or comets.
- Meteoroid Vocabulary:
  - Meteor: a meteoroid that has entered the atmosphere (also “falling star” or “shooting star”)
  - Meteorite: a meteor that has crashed into the surface
  - Meteor Shower: a regular event where a number of meteors fall at the same time
  - Fireball: a very bright meteor.
  - Bolide: a large meteor that explodes in the atmosphere
- Meteoroids groups have many different names based on composition, location, and when they affect Earth: *chondrites, achondrites, eta aquarids, chassingnite, enstatite, hexahedrite, and more!*





- **What's the difference between a planet, a moon, and a dwarf planet?**
  - Is it size? No, not really.
  - Planets orbit stars. Dwarf planets also orbit stars, but aren't massive enough to have their own orbits. Moons orbit planets (or dwarf planets).
- **What's really the difference between asteroids, meteoroids, and comets?**
  - Not much really. The categories are loose and overlap, and scientists debate all the time about changing them.
  - Differences are, 1) composition, and 2) where they are found and types of orbits





- **Exoplanets** (extrasolar planets): planets beyond our own Solar System, orbiting other stars or even floating free in space (can be of any type).
  - Super Earths: large rocky planets
  - Water Worlds: large rocky planets with oceans of water
  - Hot Jupiters: massive gas giants that orbit close to their stars
  - Hot Neptunes: medium-sized gas giants that orbit close to their stars
  - Super Neptunes: gas giants larger than Neptune
  - Cthonian Planets: rocky cores of gas giants stripped of their atmospheres
  - Brown Dwarfs: “failed stars” not really planets, not really stars
  - Rogue Planets: planets that do not orbit stars (anymore).
  - Gas Dwarfs: gas planets much smaller than Neptune/Uranus

- **What is the difference between stars, brown dwarfs, and gas planets? They are all mostly made of hydrogen and helium!**

- Is it size? No.
- Nuclear fusion! Stars have nuclear fusion reactions occurring in their cores, kicking out tremendous energy into space!

