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Space Probes

Types of Space Probes

① fly-by

- ↳ Space probe explores many targets
 - e.g. Voyager I & II visited outer planets
 - e.g. New Horizons explored Pluto & outer solar system

② orbiters

- ↳ e.g. Juno measured Jupiter's composition & magnetosphere

③ impactors

- ↳ e.g. third stages of Saturn V rockets were impacted onto the lunar surface to cause artificial moonquakes

④ (soft) landers

- ↳ impact is controlled & probe touches down intact on the surface
- e.g. Huygen's landing on Saturn's moon Titan
- e.g. Spirit & Opportunity rovers on Mars

Important Space Probes to know about

@ Juno

[ORBITER]

- orbited Jupiter
- launched 2011 by NASA
- goal: understand the origin and evolution of Jupiter
 - look for solid planetary core
 - map magnetic field
 - measure water & ammonia in deep atmosphere
 - observe auroras

- discoveries:
 - atmosphere goes much deeper than previously thought
 - symmetric storms exist at Jupiter's poles
 - Jupiter's magnetic field is twice as strong as researchers previously thought

(b) New Horizons [PLY-BY]

- explored outer solar system
- launched 2006 by NASA
- fly-by of Pluto 2015
- fly-by of Ultima Thule 2019
- goal: answer questions about Pluto & its moons
 - explore Kuiper belt objects
- discoveries:
 - Pluto has icy mountains
 - Pluto's moon Charon has far fewer craters than previously thought

c) Deep Impact [IMPACTOR]

- impacted comet Tempel 1
- launched 2005 by NASA
- goal: discover materials on comet's surface
- discoveries:
 - evidence of water ice and organic materials
 - suggested that comets may have brought this material to Earth many years ago

d) Philae [LANDER]

- landed on comet - 67P (Churyumov Gerasimenko)
- launched 2004 by ESA
- goal: land on surface of comet + explore comet's composition

- discoveries:
 - final landing site had surface of solid ice / pumice
 - atmosphere of comet contained carbon & hydrogen