

Astronomy

Abhay B.

Breakdown

Solar system

Important scientists

Stars and Galaxies

Deep Space

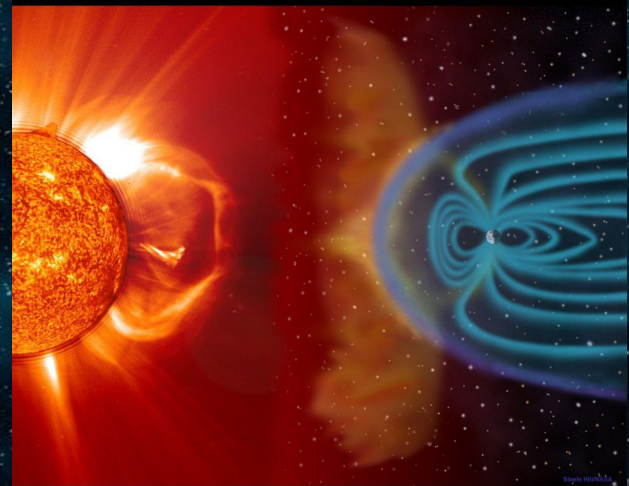
Misc.

The sun

Produces Coronal Mass Ejections - rather frequent escapes of “balls of plasma”

Sunspots- dark spots on surface around 1000 kelvin cooler than surroundings.

Follows 11 year cycles.



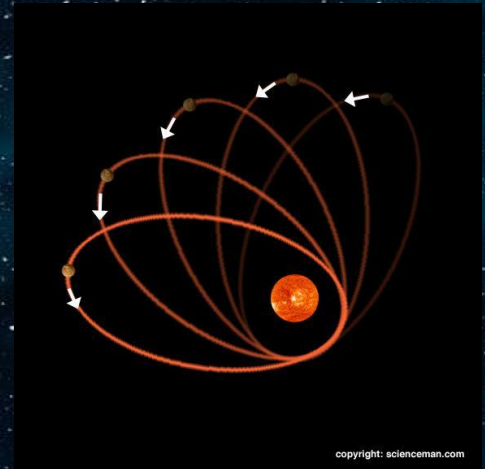
Mercury

Highest eccentricity in Solar System

Fastest year - 88 earth days

Atmosphere stripped away by solar winds and is 2nd densest planet.

Visited by **Mariner 10** & **Messenger** probe



Venus

Only planet to **rotate clockwise**, in **retrograde motion**

Highest “mountain” – **Maxwell Montes**

Sulfuric acid rain in CO₂ atmosphere

Visited by **Magellan Probe**



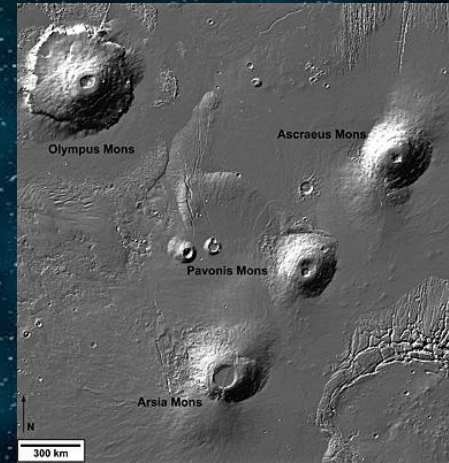
Mars

Olympus Mons on Tharsis Bulge 4 volcano system

Moons Phobos & Deimos

CO₂ dominated atmosphere like Venus

Italian Schiaparelli mapped surface in 1877 calling structures **Canali**



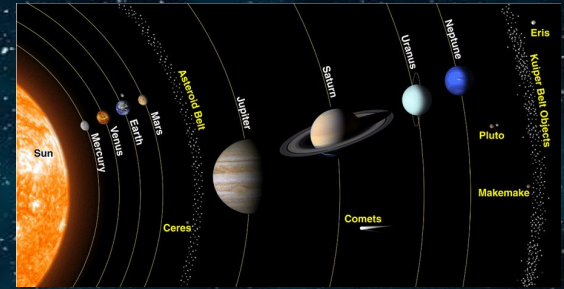
Asteroid Belt

Separates inner and outer planets, terrestrial vs. gaseous

Kirkwood gaps - Asteroids in sync with Jupiter's orbit, (3:1, 5:1)

Contains large structures like **Ceres** (largest structure) dwarf planet

Other structures - **Vesta & Pallas**



Jupiter

Galilean moons- **Ganymede**- Largest in Solar system and has it's own **magnetosphere**- **Io**- Closest to Jupiter and has **Volcanic activity** - **Europa**- Highly reflective and smallest moon. Likely to harbor **liquid ocean** beneath surface - **Callisto** - Heavily cratered and farthest away

Contains the most **Trojan Asteroids** located at **Lagrangian points**

In 1994 had massive comet **Shoemaker-Levy 9** crash into it (Saved us!)

Big red spot



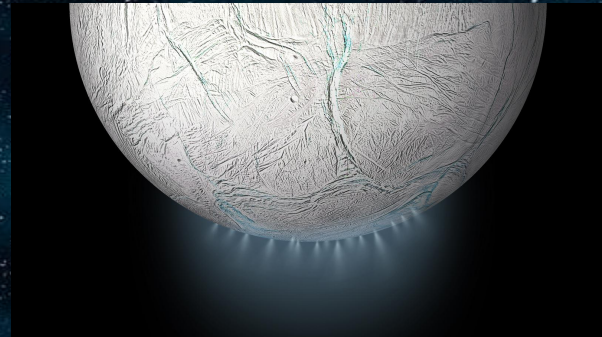
Saturn

Recurring clue- In 2005, the Huygens probe landed on this planet's largest moon Titan (2nd-largest in solar system)

Least dense planet (Would “float” in our ocean)

Cassini Gap in rings. Cassini mission ended when crashed deliberately into atmosphere

Enceladus is moon with working geysers



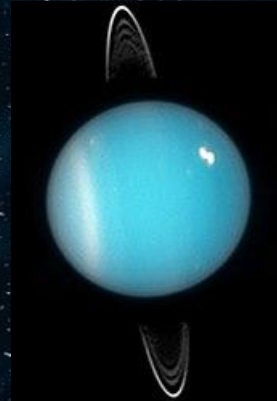
Uranus

Extremely tilted 90 degrees!

Famous moons named **Titania and Oberon** - Shakespeare

Discovered by **William Herschel** temporarily naming it **George's star**

Has retrograde motion like Venus



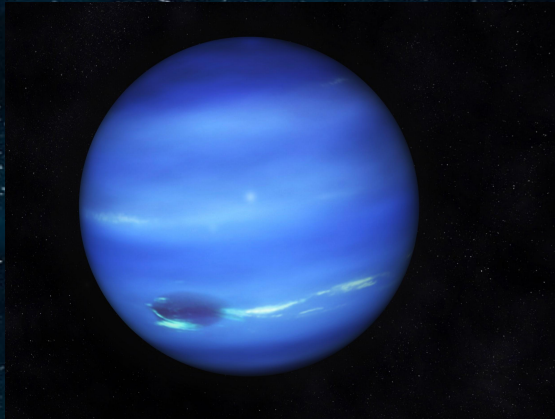
Neptune

Largest moon **Triton** experiences retrograde motion

Great Dark Spot

Liberty, Equality, and Fraternity make up Adams ring

First pictured by Voyager 2



Pluto

New Horizons did a flyby in 2015

Prominent Neighbors - **Charon, Hydra, Nix**

Discovered by **Clyde Tombaugh**, inferred to exist by **Percival Lowell**

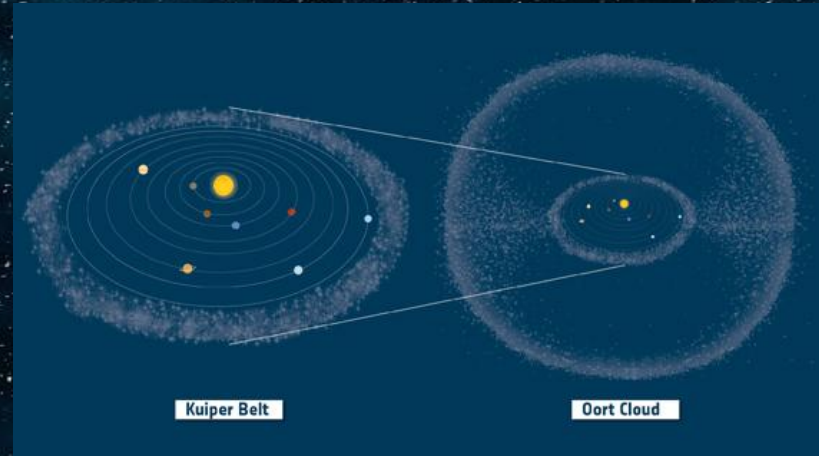
Is not a planet because it hasn't cleared its "neighborhood"



Kuiper Belt and Oort Cloud

Kuiper belt- **Pluto** is largest body. Trans-Neptunian objects. Surrounds all planets

Oort Cloud- Sphere like structure that encompasses entire solar system. Thought to be origin to **Short Distance comets**



Hubble

Discovered expansion of universe

Redshift



Galileo

Tried by Catholic church for ideas on Heliocentrism. “And yet is moves”

Discovered the 4 major moons of Jupiter

Apparently dropped cannonballs from Tower of Pisa



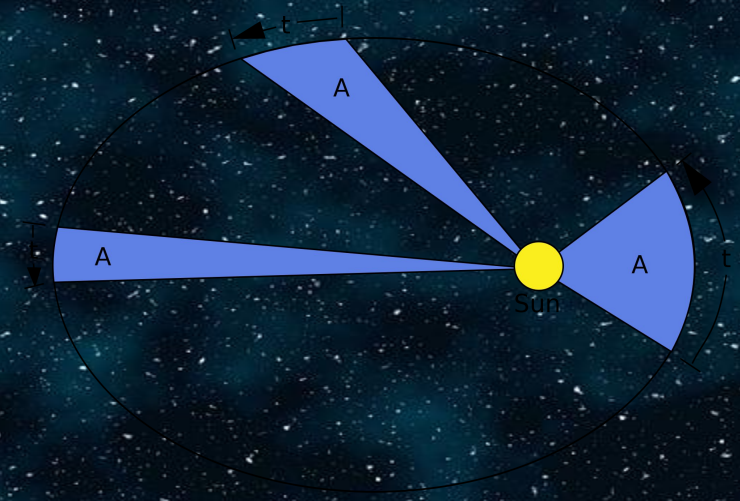
Keppler

3 Laws of Planetary Motion - Elliptical orbits around sun, sun is a foci(1st)

Equal areas over equal times (2nd)

Semi Major Axis (3rd)

Studied under Tycho Brahe



Andromeda

AKA Messier-31 Spiral galaxy twice the size of Milky Way

Largest galaxy in Local Group

On **collision course** with Milky Way



Magellanic clouds

2 dwarf irregular galaxies named after Magellan

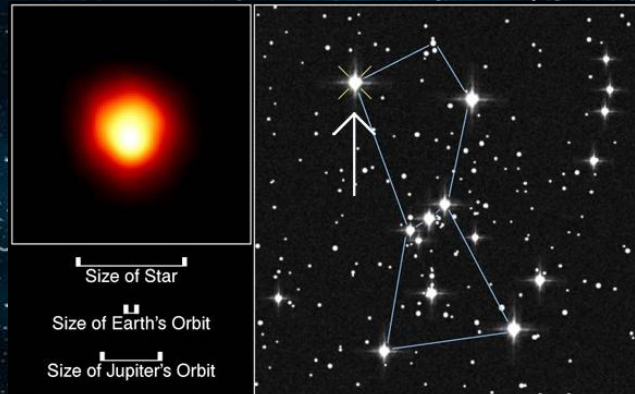


Stars

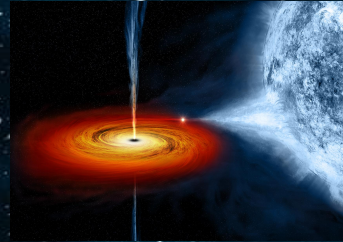
Polaris - north star, found at end of ursa minor, will be **replaced by Vesta** in 13,000 years as north star

Sirius- **Brightest Star in Night Sky**, has companion star Sirius B a white dwarf

Betelgeuse- Red Supergiant that makes up the **shoulder of Orion**



Black Holes



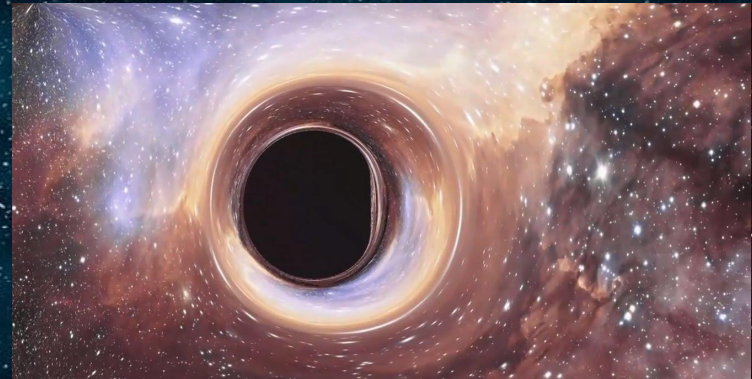
Schwarzschild radius

No Hair Theorem- only known properties, mass, charge, angular momentum

Hawking Radiation - As they “evaporate”

First discovered in constellation **Cygnus**

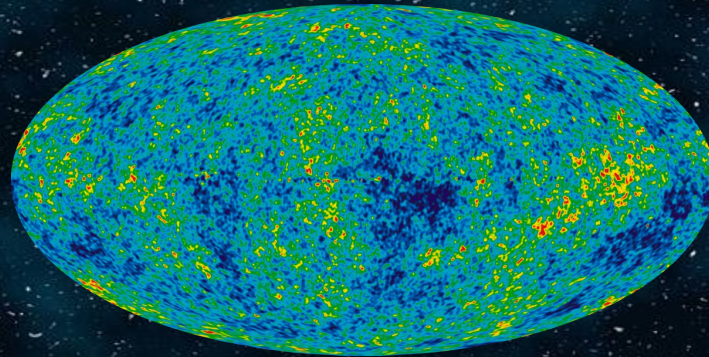
Supermassive one in middle of **Sagittarius**



CMB

Shows Universe's temperature to be 2.7 Kelvin

Discovered by **Wilson and Penzias** - Originally thought to be Pigeon droppings



First man in space - Yuri Gagarin

Resources

Cosmos - netflix