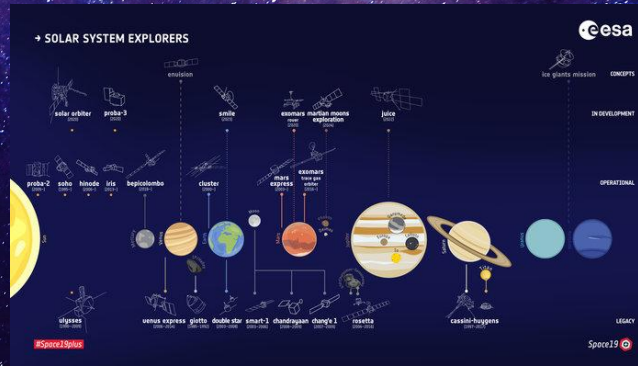
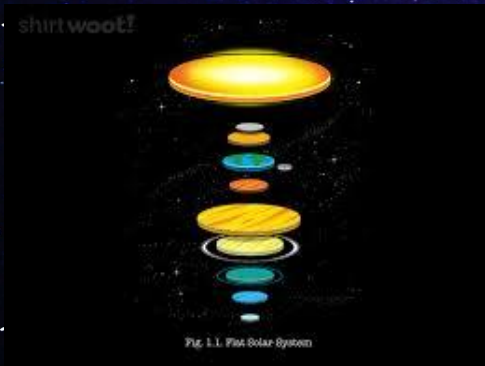




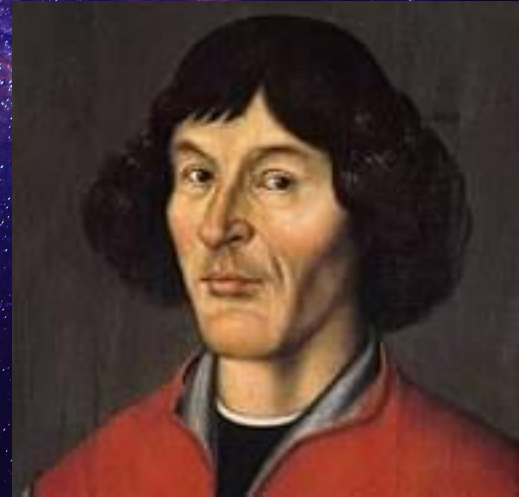
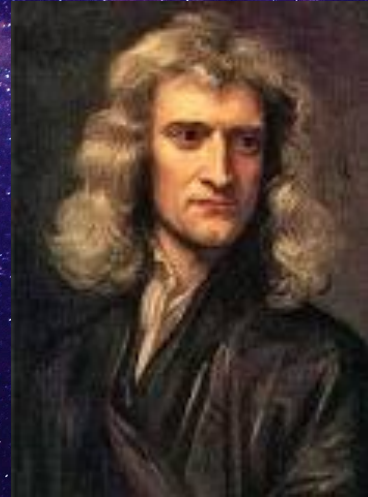
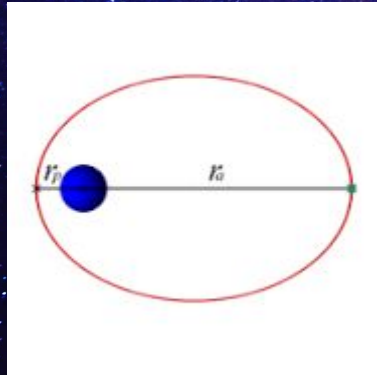
Earth and the Solar System

By: Leon Kornfeld, Georgik Markarian, Connor Lee



Origins of the Solar System

- Solar System: Everything held by the sun's gravity
- Copernicus is credited for the geocentric model of the solar system
- Kepler is the one who said that the planets orbit in an ellipse
- Newton used this information to see how gravity works in our solar system
- Sol means sun in Latin

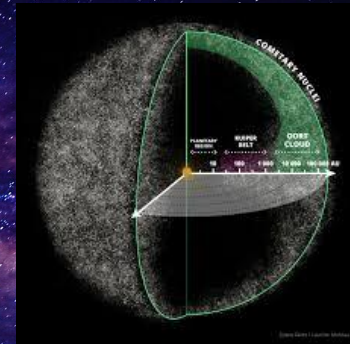
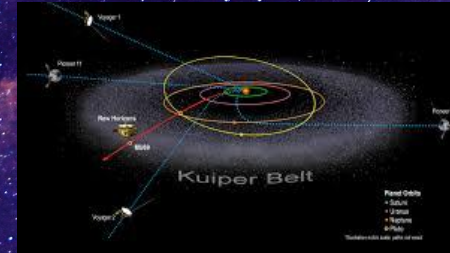


Formation of Solar System

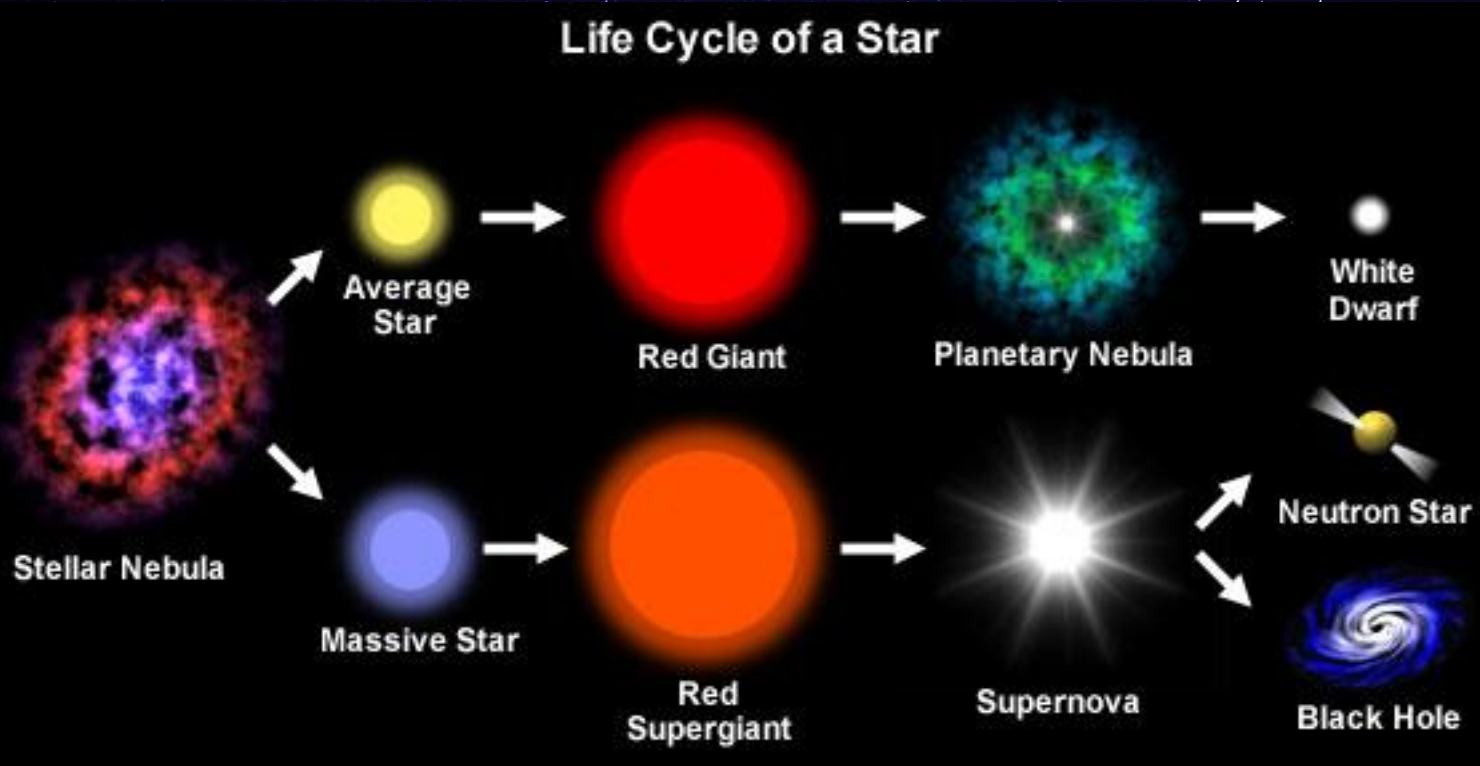
1. Stellar Nebula was in balance from the gravity pulling in and the heat pushing out.
2. All of a sudden it collapsed
3. The center started attracting material and became hot and dense
4. Material farther out started crashing into each other forming planet
5. The center of the star got so hot that it started fusing hydrogen to make helium
 - a. It became a star
6. The hot rocky inner planets could not hold on to the hydrogen and helium emitted from the sun
7. Further out the planets were cooler and bigger, so they could hold on to the gas, becoming gas giants
8. All the ice, rocks, and particles, that did not form into planets, became the two asteroid belts and the Oort Cloud

Solar System

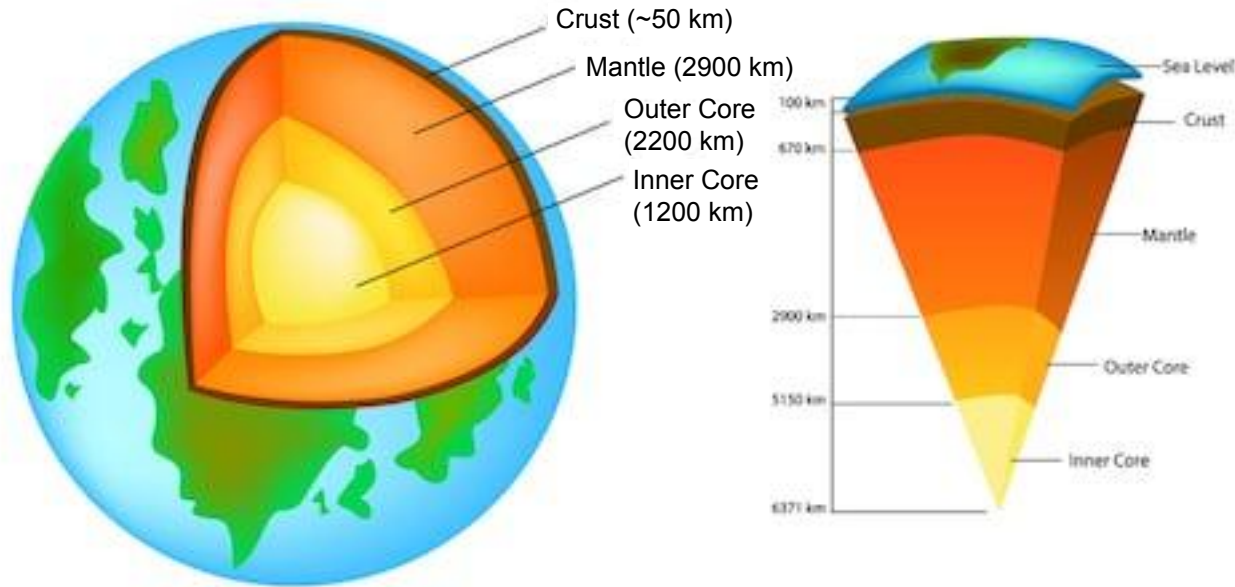
- Inner Planets
 - Mercury, Venus, Earth, Mars
 - Characteristics:
 - Rocky, small, dense, a few moons
 - Venus has no moons
- Outer Planets
 - Jupiter, Saturn, Uranus, Neptune
 - Characteristics:
 - Massive, Higher Gravity, Gaseous, Less dense, More moons
- Asteroid Belt between Mars and Jupiter
- Kuiper Belt beyond Neptune
- Solar system surrounded by Oort Cloud



A Star is Born



Earth Layers



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Materials:

Crust -

Solid rock

Mantle -

Liquid silicon, iron, magnesium, aluminum,

Outer Core -

Liquid Iron & Nickel

Inner Core -

Solid Iron & Nickel

Temperature:

Crust: 0°C - 870°C

Mantle: 3700°C

Outer Core: 4300°C

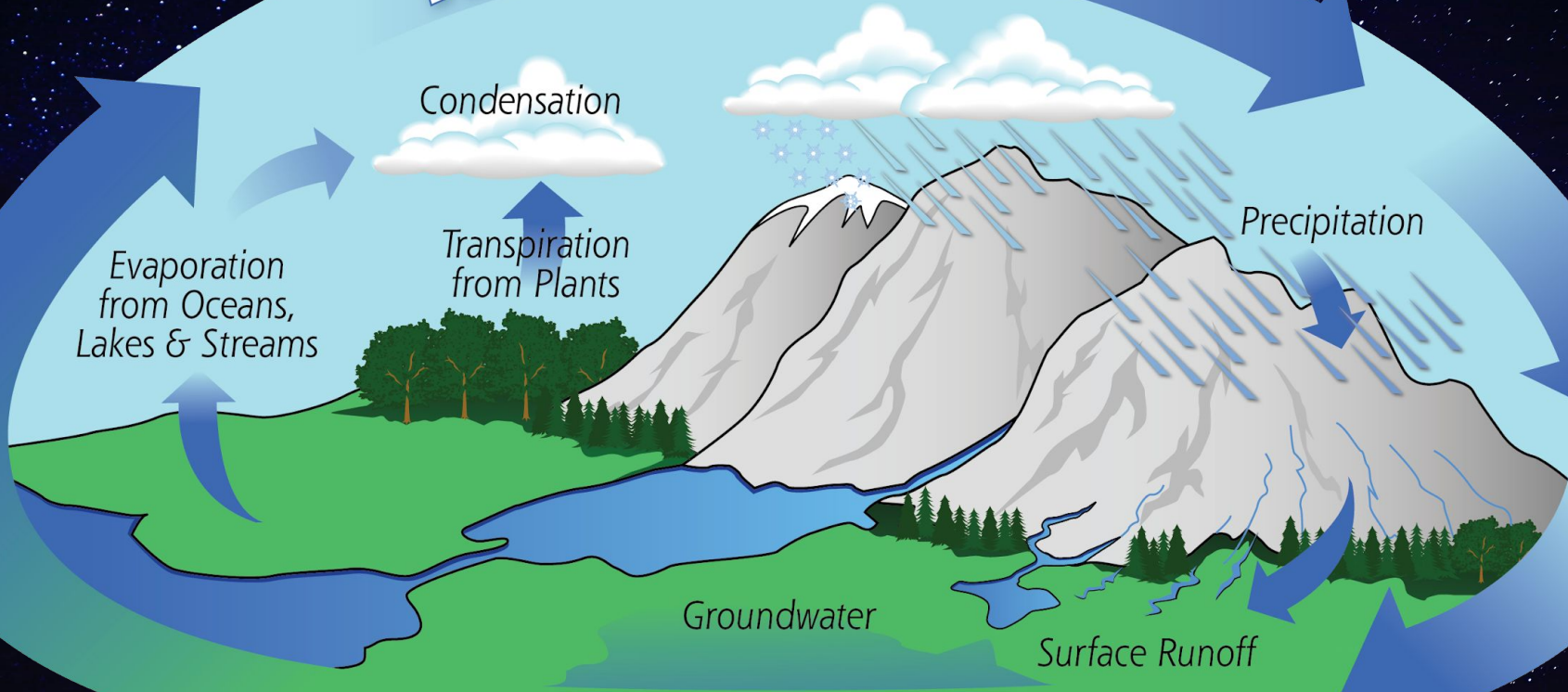
Inner Core: 7200°C

Earth's Interior

- Earth's crust is made out of different plates, called tectonic plates that float on the mantle
- Tectonic plates move constantly, causing earthquakes, volcanos, and the movement of continents
- The crust floats on the mantle due to convection currents
- The Earth is still hot
 - Uranium Decay, Friction, Leftover Heat from Formation, Pressure from Gravity
- The liquid core conducts electricity and convects which induces a magnetic field
- The Earth's rotation organizes the field and uses it to block UV radiation from the sun and deflects particles from the solar wind
- Without it our atmosphere would get stripped away and we'd end up like Mars.

Water Cycle

WATER CYCLE



Water Cycle Terms

Condensation → water which collects as droplets on a cold surface when humid air is in contact with it

Evaporation → the process of turning from liquid into vapor

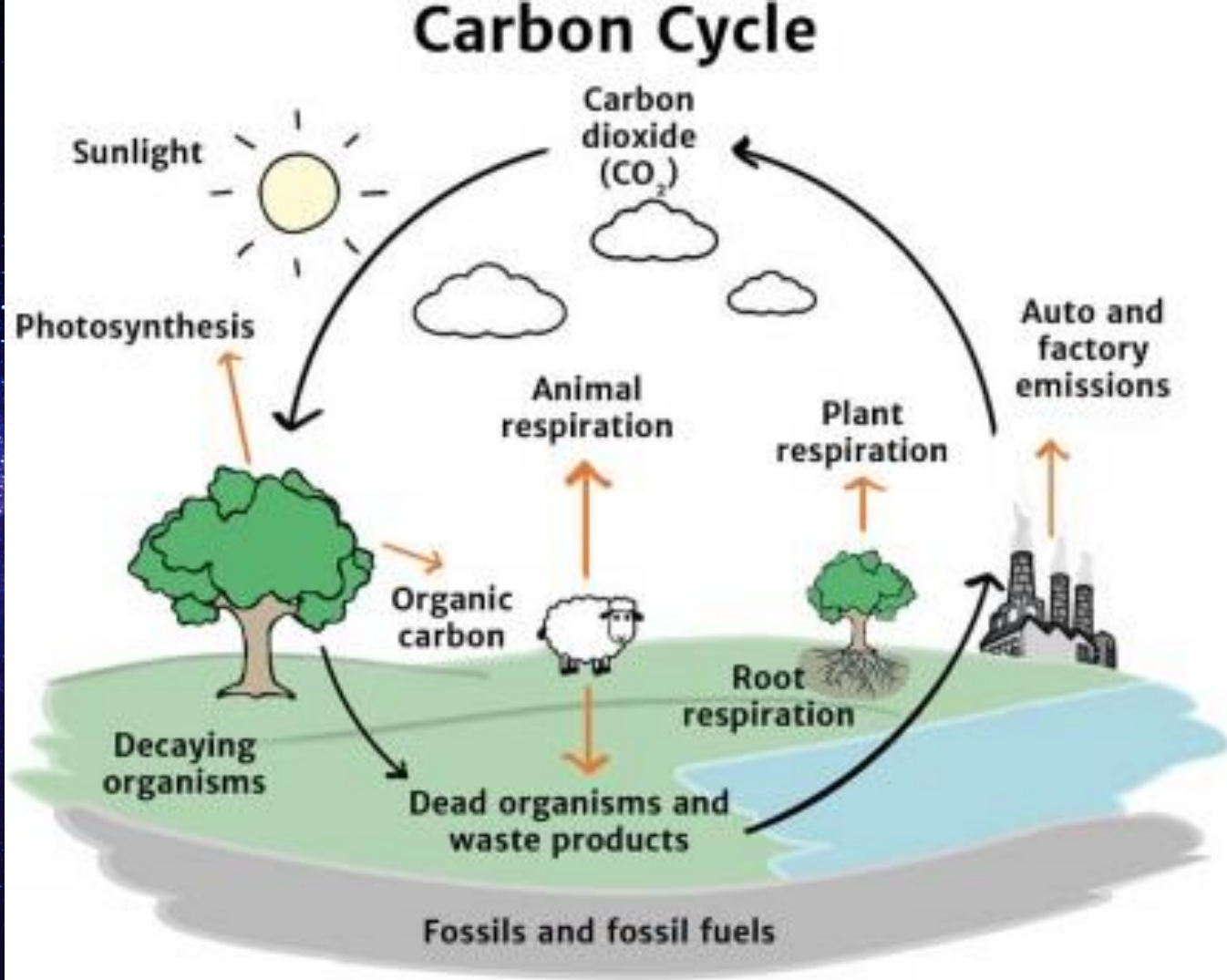
Transpiration → The exhalation of water vapor through the stomata

Precipitation → rain, snow, sleet, or hail that falls to the ground

Sublimation → A solid such as ice turning directly into a gas

Deposition → A gas turning directly into a solid

Carbon Cycle



Carbon Cycle Terms

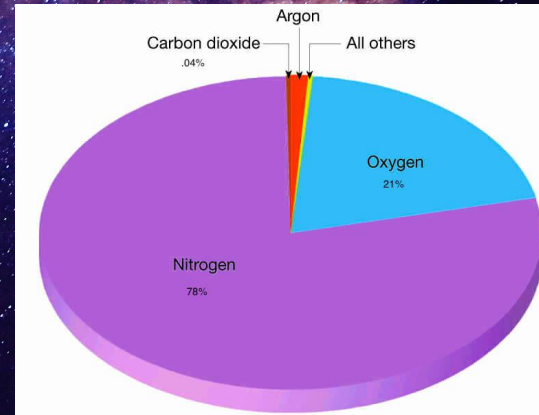
Carbon Dioxide → a colorless, odorless gas produced by burning carbon and organic compounds and by respiration

Photosynthesis → the process by which green plants and some other organisms use sunlight to synthesize foods from carbon dioxide and water

Respiration → a process in living organisms involving the production of energy, typically with the intake of oxygen and the release of carbon dioxide from the oxidation of complex organic substances

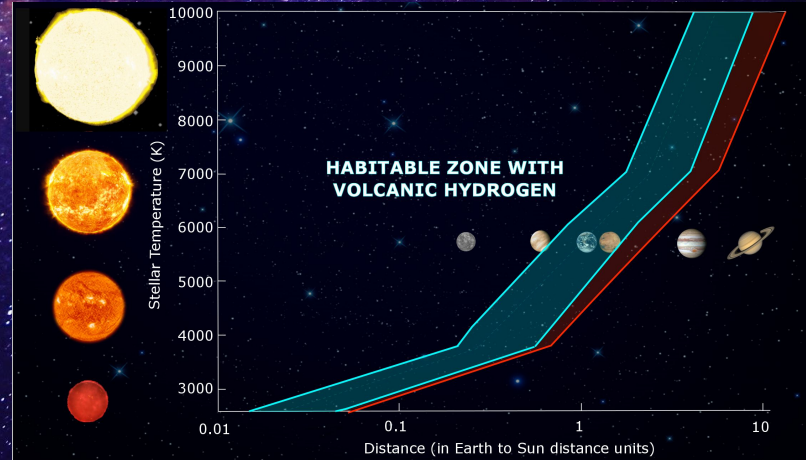
Atmosphere and Greenhouse Effect

- We have lots of machines and factories that release CO₂ into the atmosphere
- A small amount of CO₂ in the atmosphere is good, or we'd freeze to death
- With so much CO₂, it traps the infrared radiation and heat, causing it to warm up.
- This causes icebergs to melt, and the sea levels start rising
- This is contributing to global warming.



Habitable Zone

- The habitable zone is the area where liquid water on planets can be found
- If the star is hotter and bigger, then the habitable zone will be larger and farther away
- If the star is colder and smaller, the habitable zone will be smaller and closer
- In our Solar System, Earth and Mars are part of the Habitable Zone



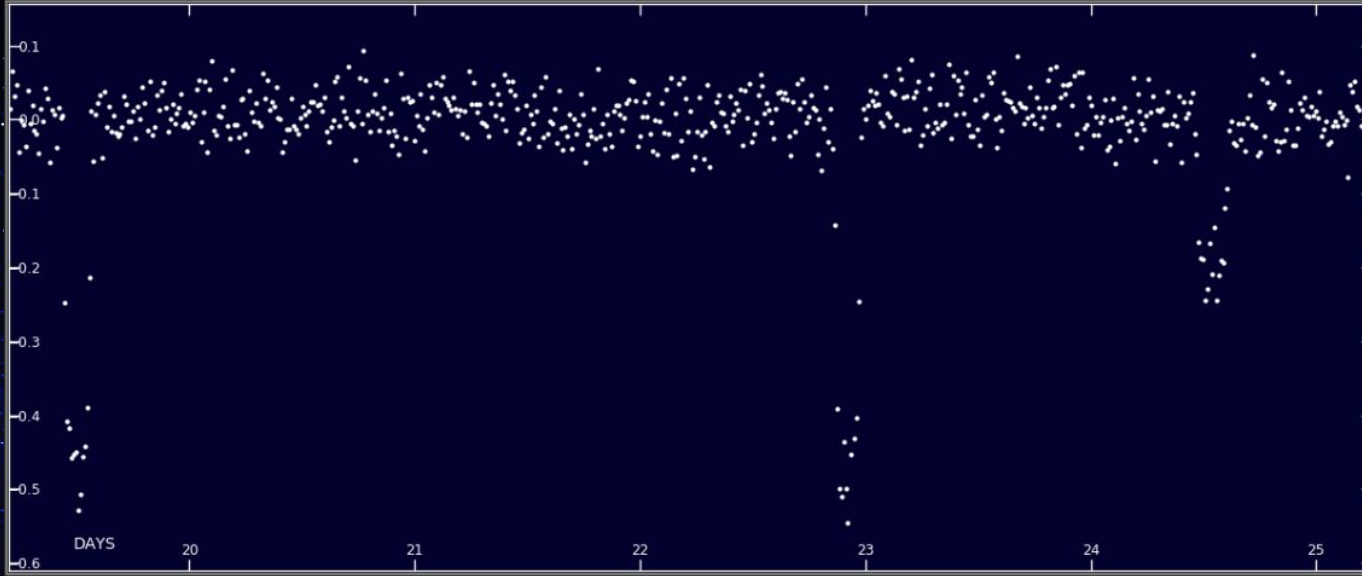
Exoplanets

5 methods to find exoplanets

- Radial Velocity - See if there is a shift in color, and if there is it means it is being acted upon by a planet
- Transit - When a planet passes in front of a star
- Direct Imaging - Taking a picture, taking out the glare
- Gravitational Microlensing - If light bends from its source, you know gravity is acting on it from a planet.
- Astrometry - See how a star moves relative to other objects



Brightness Charts



- If you see a vertical drop in brightness, it is most likely a transit
- To find the orbital period, you find how many times and at what days the transits repeat
- You can find many characteristics of stars from the chart
 - Mass
 - Temperature
 - Radius