25/3/26
Wednesday

Q. Blackholes are also called as collapsers. How they are formed and discovered?

Answer

Blackholes as Collapsers

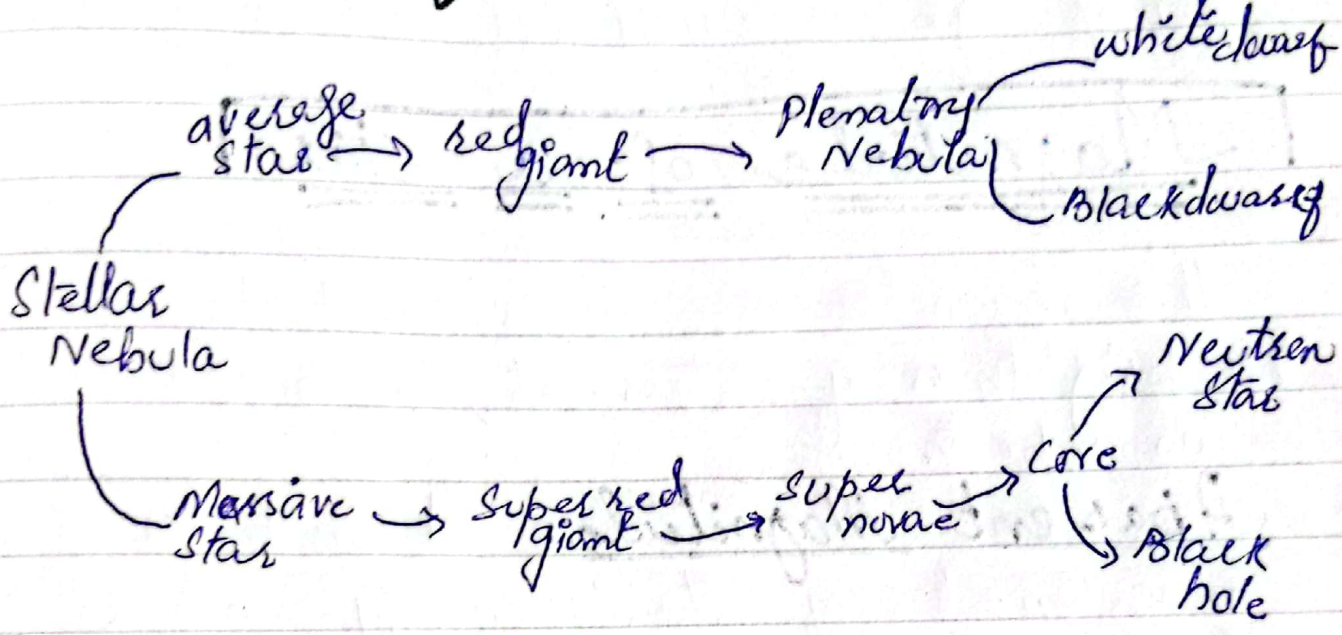
"Blackholes is a huge concentration of matter tightly packed into a tiny space. Its gravitational pull is so ~~tight~~ strong that light even cannot pass from it!

Blackholes are also called as **Collapsers** as massive gas clouds of a dying star collapse into an infinitely singular space.

Formation of Blackholes

There are given 4 theories about the formation of a black hole — Seed theory, Supernovae theory, heavy seed theory and premordial theory. These theories suggest that black holes are formed from **Stellar death**. When a massive star's nuclear fuel finishes its core collapse inward due to high gravitational pull forms a supernovae and then black hole is born.

Formation of Blackhole



① Discovery of Blackhole:

Blackholes were first proposed theoretically by Albert Einstien in early 20th century. While first blackhole was discovered in 1960s - 1970s named as **Cygnus - X1**. Now, The direct discovery of blackholes is possible through Event horizon telescope.

The discovered blackholes include Sagitarius A* (star) blackhole & Gaeia BH1 etc.

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Q What is the magnitude of a star and how the color of stars is correlated with their temperature

Magnitude of a star:

The magnitude scale is used to measure the brightness of stars. it is based on two aspects

Apasent Magnitude: It includes the measurement of star's energy and it is with respect to the distance from the posetion of observer on the Earth. It is shown through (m).

Absolute Magnitude: It is measurement of a star's energy on the standard distance of 10 parsecs (32.6 lighty eans). It is solely based on its energy output. It is shown through (M).

The Magnitude scale:

It is logarithmic and invested. 5 magnitudes equal factors of 100 in brightness.

Brighter stars. The stars with lower or negative magnitude value are bright such as Sirius having -1.46 value. and Sun having -26.7 value.

Fainter stars: The stars with higher or positive value almost above +6 are fainter stars. such as Betelguese, Proximea Centauri.

The Color of star is correlated with their temperatures

The color of a star indicated the temperature of it. stars are black body radiative which emit light energy dependent on their temperatures solely.

Stars are categorized on basis of their color corelation with temperatures as below...

Red / Orange stars: These stars emit light at longer wavelength and appears as red. These stars have temperature of 3000 K to 4000 K.
exampligratia: Betelguese, Proximae Centauri, Arcturus etc.

Medium stars: These stars emit light at medium wavelength and appear as yellow or yellow white. These stars have temperature of 5200 K to 6000 K.
exempligratia. Sun, Alpha Centuri A. procyon etc.

Blue / Blue-White Stars: These stars emit light at shorter wavelength and appear as blue star. These stars have temperatures of 10,000 K - to 30 000 K.

exemplignatia: S. Monocerotis, Rigel, Sirius Spica etc.

Q How global warming can be reversed? (5)

Answer

Solutions to Global Warming:

Global warming now called as global boiling by UNGA's secretary general- Antonio Gutteres is a serious threat to the life and sustainability of the mother Earth. It is due to the natural and phenomenon as well as human activities. Global warming can be reversed by the following methods.

Adaptation:

Reforestation: Plant trees in the regions where once were forests as forests work as carbon sink and provide a huge amount of oxygen and air.

Aforestation: Plant trees also in the regions that are barren and never have plants to increase the forests bed for better atmosphere.

Green technology: Adopt and launch the green technology as the vehicles and other machinery which cause global warming. while green technology mitigate the global warming emit green house gases

Mitigation:

Urbanization: Lessen the construction of infrastructure in less area. Construction if necessary is to be done horizonally as urbanization acts as carbon bed of a region which causes global warming.

GHGs emission: The Green house gases are another cause of global warming so mitigating their emission by adopting green technology can reduce the hazardous effects of global warming.

Q What is Rock Cycle? Define types of rocks? (10)

Rock Cycle: It is a geological process of transforming into their different types or forms driven by plate tectonics, wheathering and heat & pressure.

Processes occur in Rock Cycle:

Wheathering and Erosion: Breakdown of rocks and transport of materials.

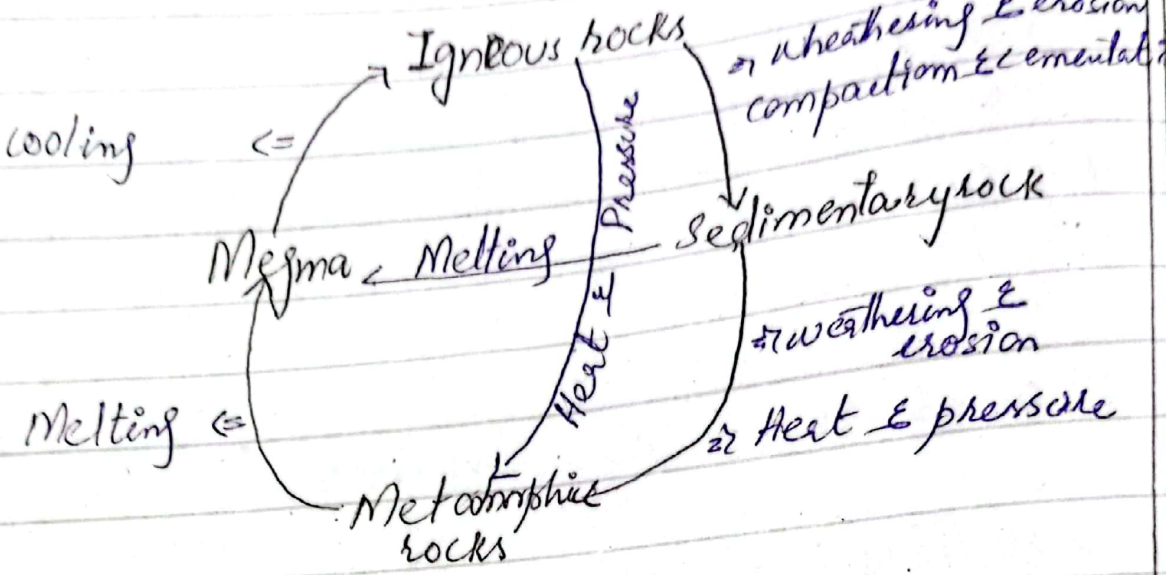
Compaction and Cementation: fragments compacted and cemented together to form rocks.

Metamorphism: Change in structure through heat and inense pressure.

Melting: Rocks melt back into megma due to high temperature.

These rocks are transformed and transfered through given process where these rocks change from one form to another.

The Rock Cycle



The Types of Rocks

⇒ There are three basic types of rocks which are further divided into sub-types.

1. **Igneous Rocks:** These rocks are formed from the magma and lava of volcanoes. These are also called as magmatic rocks.

   i. **Intrusive Igneous rocks:** These rocks are formed under the volcano from magma. These are also known as Plutonic igneous rocks.

   e.g. Granite and diorite

ii. Extrusive Igneous rocks: These rocks are formed from lava. These are also known as volcanic igneous rocks.
example: Basalt, Obsidian & Pumice etc

2. Sedimentary Rocks: These rocks are formed from left over fragments of rocks and other things.
These are of three types.

i. Calstic rocks: These rocks are formed left over of original rocks.
example: sandstone

ii. Organic rocks: These rocks are formed from left over of dead plants, Crustacians and excretion of birds - phospate.
e.g. coal, $CaCO_3$

iii. Chemical rocks: These are formed left overs also through wheathering and esosion. when water evaporates from salt, silica etc.
e.g. limestone, halite, flint etc.

3 **Metamorphic Rocks:** These rocks are formed when the original rocks come under heat and immense pressure.

These are of two types.

i. **Foliated rocks:** These rocks are formed linedup with minerals like foliation due to the pressure.
e.g. Gneiss (Granite metamorphic rock)
Jade

ii. **Non-foliated rocks:** These rocks are formed with minerals like grains on them. These grains cannot be seen with naked eye. or lines of minerals unseen.
e.g. Quartzet, anthracite coal and masble.