

Class 11th | Geography



Fundamental of Physical Geography

Unit : II - Chapter 2

THE ORIGIN AND EVOLUTION OF THE EARTH

Lecture 3

① → George Lemaître {Explosive} →

Big Bang Theory

① → It is also called as Expanding Universe

Hypothesis.

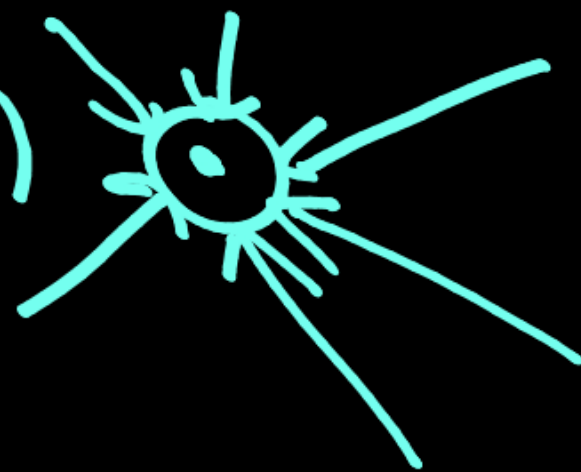
$\Delta D \propto \Delta t$

② (Edwin Hubble) (1920) → Big Bang → Expanding (example)

{Balloon} → Galaxies

③ {Singularity} (Single Point)

→ Universe → Explosion: Blast
Expansion (It is still)



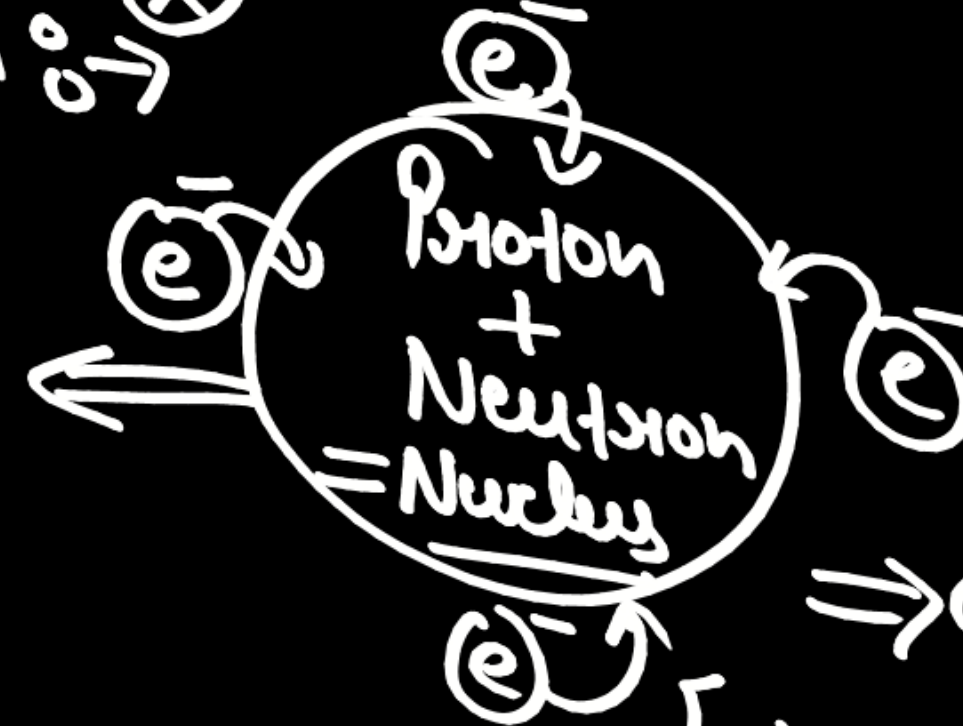
④
Density
(∞)
Temperature
(∞)

Big Bang Theory

→ Blast : 3 sec → Min → Universe, Galaxies, SUN, Planets

→ Atom : ⊗

{ Revolve }



⇒ Atom

→ Hydrogen
→ Helium

Big Bang Theory

5 Marks
13 Marks

⇒ According to Big bang theory. ① Volume Small
 ↳ Add the "Matter" forming universe. existed at a one
 Place in the form of "tiny ball" (Singularity)
 (Having small volume, infinite temperature ↳ Singularity
 & infinite Density. atom

②

At the Big Bang "Tiny Ball" exploded violently.
 this led to huge explosion & it is believed that.

the big bang happened 13.7 billion years ago.
expansion continues till today as it grew
some energy converted into Matter.

there was particularly Rapid expansion after
the fraction of second. After this expansion slowed
down & after the first 3 Min of Big bang
the first Atom was formed.

③ Within 3,00,000 yrs of big bang Temperature slowed down to 4500 K (Kelvin) and gave Rise to atomic Matter. & hence Universe become transparent.

⇒ (Hoyle's concept) ⇒ (same state)
of steady state
↳ constant

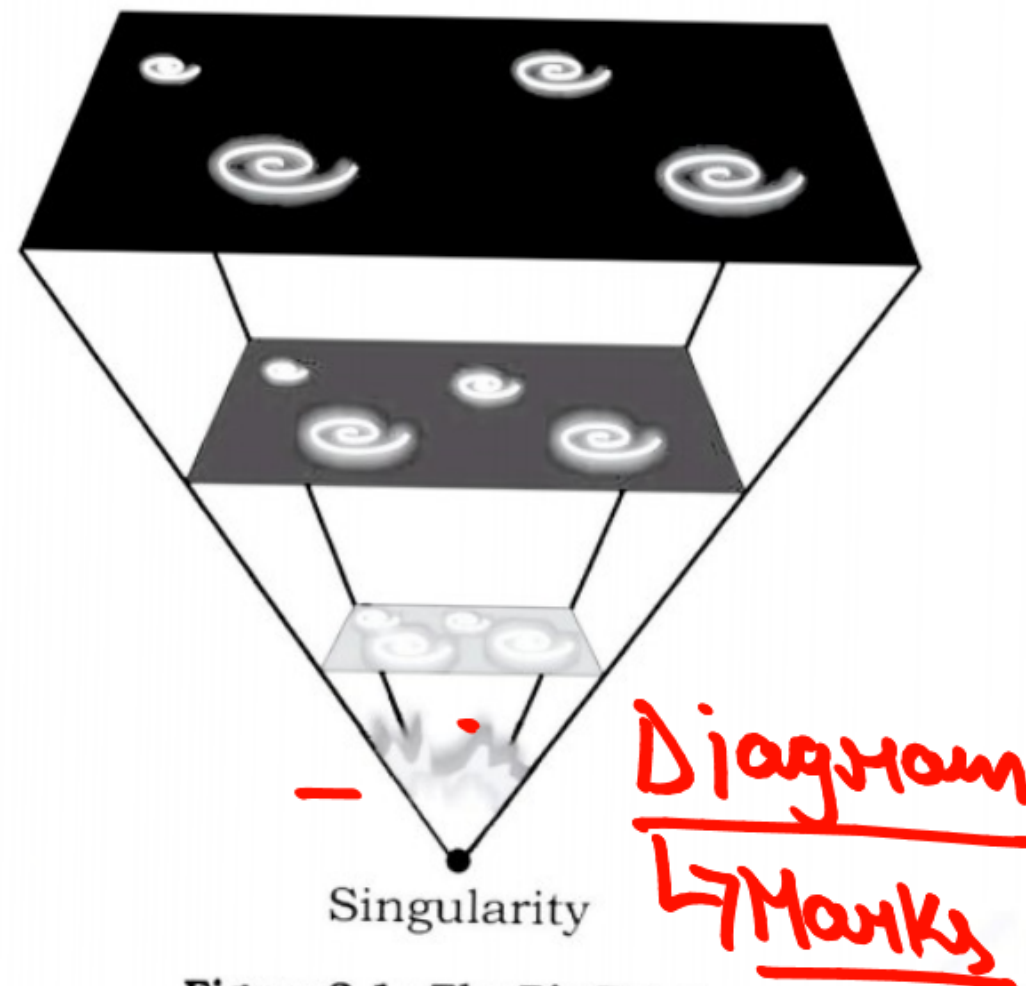


Figure 2.1 : The Big Bang

The Big Bang Theory considers the following stages in the development of the universe.

- (i) In the beginning, all matter forming the universe existed in one place in the form of a "tiny ball" (singular atom) with an unimaginably small volume, infinite temperature and infinite density.
- (ii) At the Big Bang the "tiny ball" exploded violently. This led to a huge expansion. It is now generally accepted that the event of big bang took place 13.7 billion years before the present. The expansion

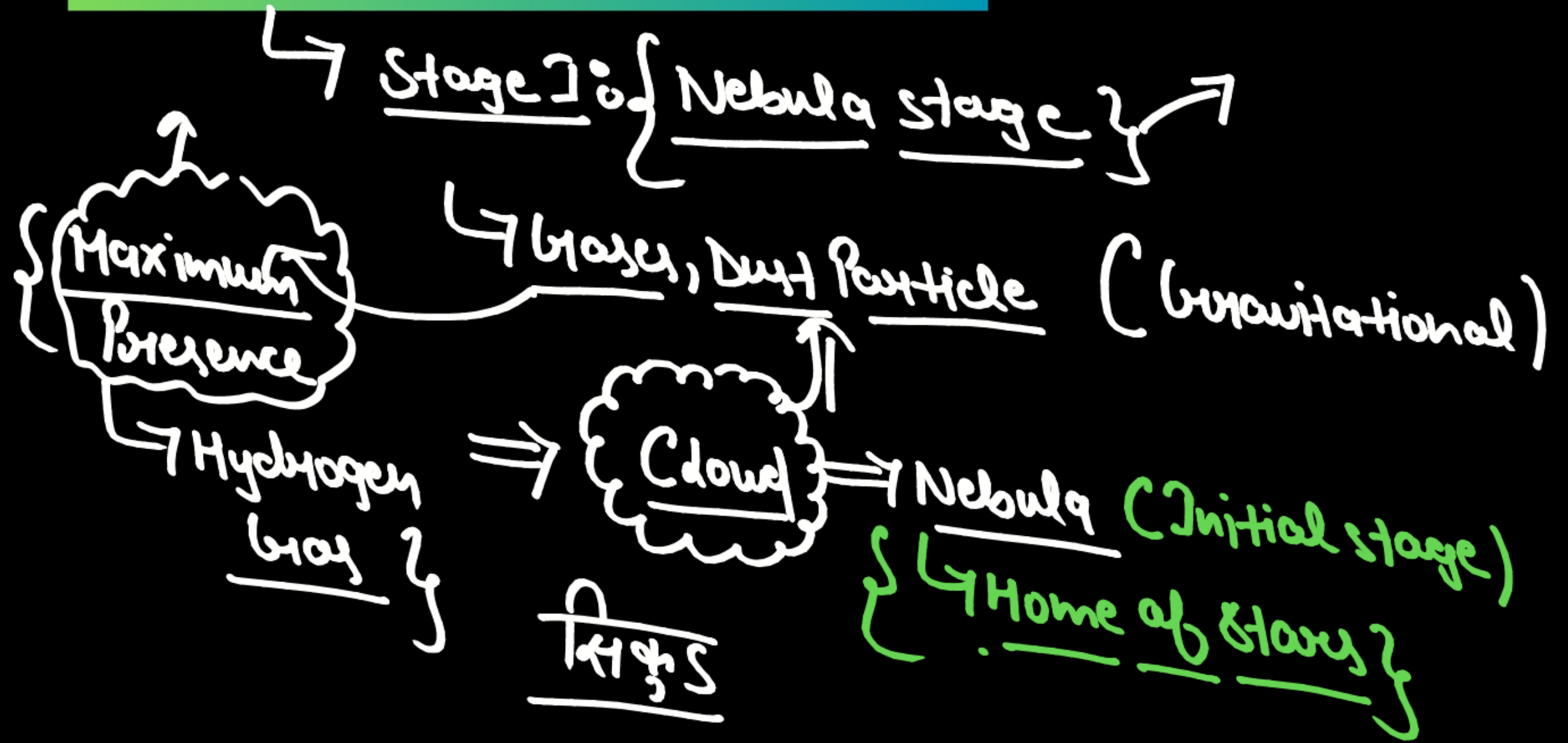
evidence becoming available about the expanding universe, scientific community at present favours argument of expanding universe.

The Star Formation

The distribution of matter and energy was not even in the early universe. These initial density differences gave rise to differences in gravitational forces and it caused the matter to get drawn together. These formed the bases for development of galaxies. A *galaxy* contains a large number of stars. Galaxies spread over vast distances that are measured in thousands of *light-years*. The diameters of individual galaxies range from 80,000-150,000 light years. A galaxy starts to form by accumulation of hydrogen gas in the form of a very large cloud called *nebula*. Eventually, growing nebula develops localised clumps of gas. These clumps continue to grow into even denser gaseous bodies, giving rise to formation of stars. The formation of stars is believed to have taken place some 5-6 billion years ago.

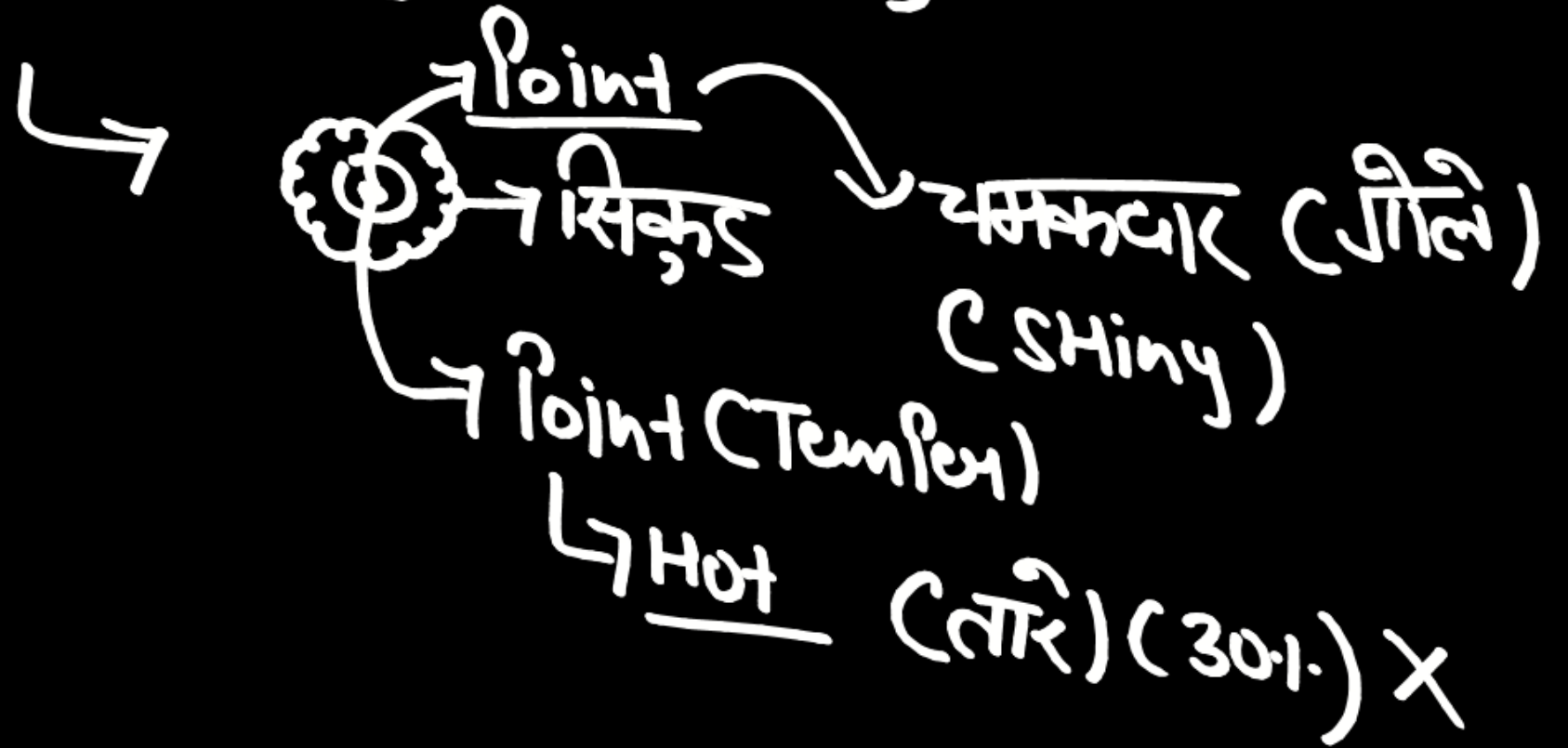
A light year is a measure of distance and not of time. Light travels at a speed of 300,000 km/second. Considering this, the distances the light will travel in one year is taken to be one light year. This equals to 9.461×10^{12} km. The mean distance between the sun and the earth is 149,598,000 km. In fact, the distance

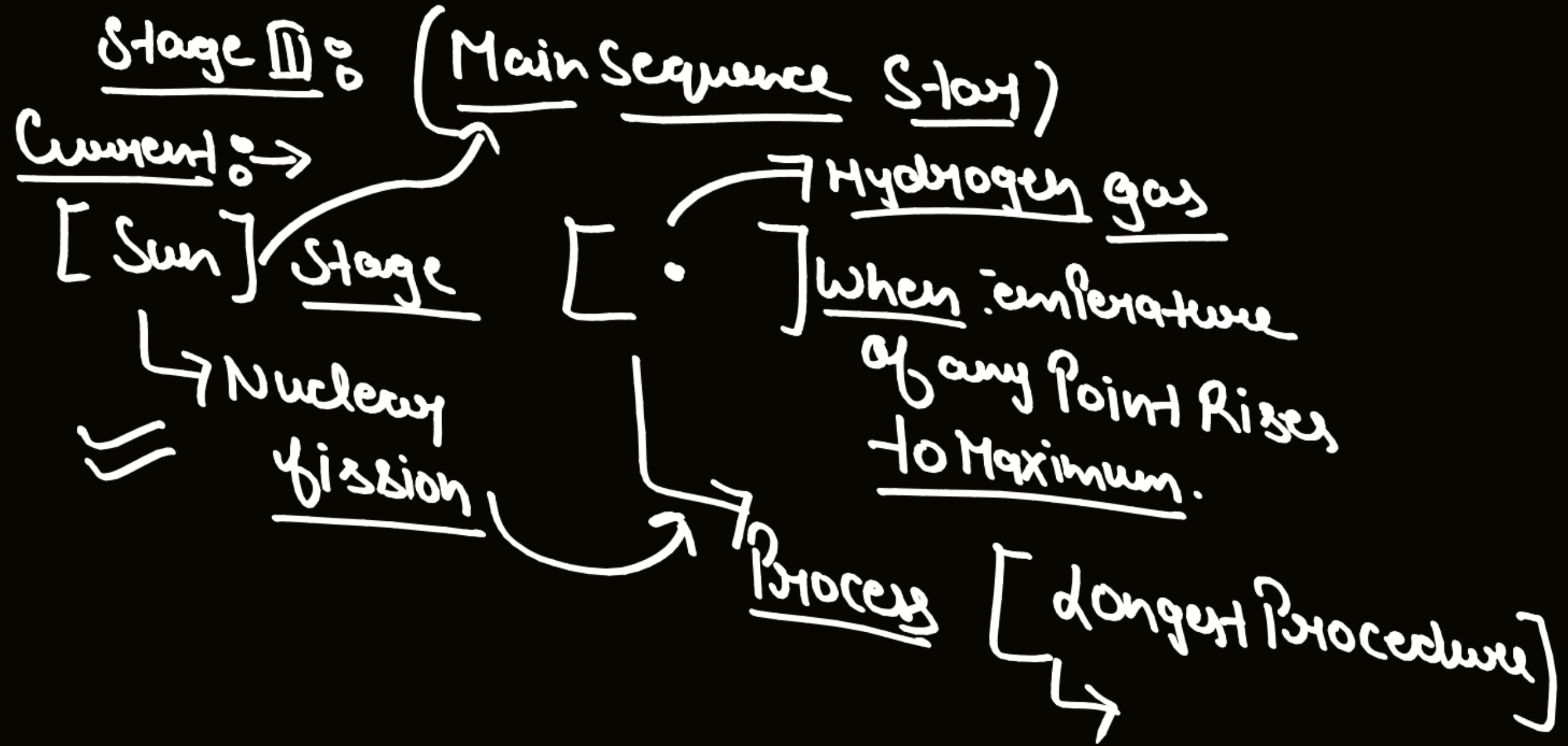
Stages of Star Formation



Stages of Star Formation

↳ Stage I : પ્રારંભિક સ્તર





Stage IV (Red briant)

Stage V [End stage]

रुकना नहीं है, थमना नहीं है,
तुम्हें खुद को पाना है।



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