Class 11th | Geography

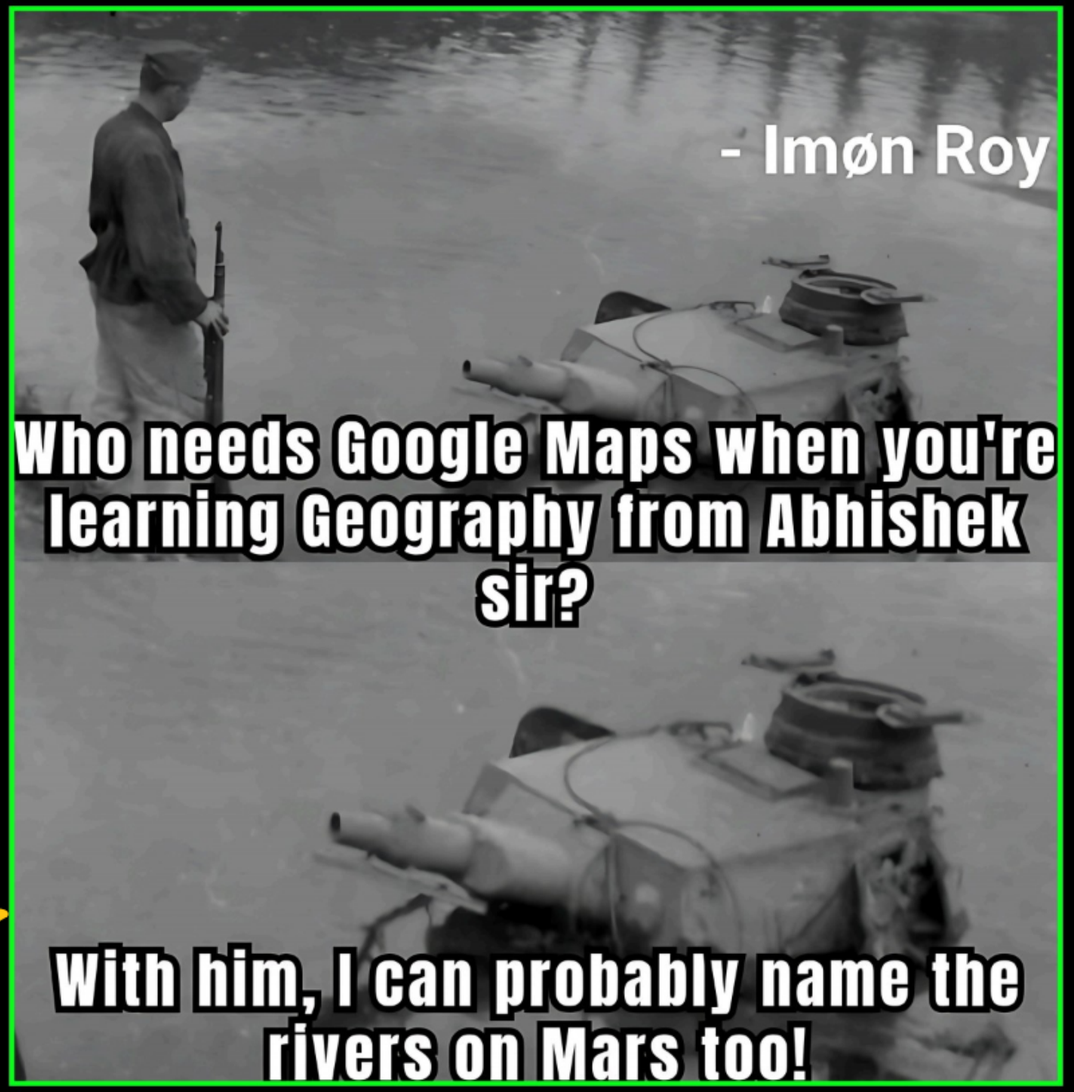
Fundamental of Physical Geography

Unit : II - Chapter 2

THE ORIGIN AND **EVOLUTION OF THE EARTH**

Lecture 2

GEOGRAPHY IS LOVE


- Imøn Roy
Who needs Google Maps when you're learning Geography from Abhishek sir?
With him, I can probably name the rivers on Mars too!

Starry nights have always attracted us since the childhood. You may also have thought of these stars and had numerous questions in your mind. Questions such as how many stars are there in the sky? How did they come into existence? Can one reach the end of the sky? May be many more such questions are still there in your mind. In this chapter, you will learn how these "twinkling little stars" were formed. With that you will eventually also read the story of origin and evolution of the earth.

Early Theories

Origin of the Earth

A large number of hypotheses were put forth by different philosophers and scientists regarding the origin of the earth. One of the earlier and popular arguments was by German philosopher Immanuel Kant. Mathematician Laplace revised it in 1796. It is known as *Nebular Hypothesis*. The hypothesis considered that the planets were formed out of a cloud of material associated with a youthful sun, which was slowly rotating. Later in 1900, Chamberlain and Moulton considered that a wandering star approached the sun. As a result, a cigar-shaped extension of material was separated from the solar surface. As the passing star moved away, the material separated from the solar surface continued to revolve around the sun and it slowly condensed into planets. Sir James Jeans and later Sir Harold Jeffrey supported this Russia and Carl Weizascar in Germany somewhat revised the 'nebular hypothesis', though differing in details. They considered that the sun was surrounded by solar nebula containing mostly the hydrogen and helium along with what may be termed as dust. The friction and collision of particles led to formation of a disk-shaped cloud and the planets were formed through the process of accretion.

However, scientists in later period took up the problems of origin of universe rather than that of just the earth or the planets.

Modern Theories

Origin of the Universe

The most popular argument regarding the origin of the universe is the *Big Bang Theory*. It is also called *expanding universe hypothesis*. Edwin Hubble, in 1920, provided evidence that the universe is expanding. As time passes, galaxies move further and further apart. You can experiment and find what does the expanding universe mean. Take a balloon and mark some points on it to represent the galaxies. Now, if you start inflating the balloon, the points marked on the balloon will appear to be moving away from each other as the balloon expands. Similarly, the distance between the galaxies is also found to be increasing and thereby, the universe is considered to be expanding. However, you will find that besides the increase in the distances between the points on the

Immanuel Kant theory (1755) → Hypothesis

Criticism :→
- Why 9 Planet
- ② Motionless Motion

② assumption → {law of gravitation}

Motionless ↓ Motion

① ⇒ Primodial Matter { Cold, Motionless Solid }

② Particle Scatter { Heat, Motion Gas }

9 Ring → Planets

② Laplace {1796} → Cold ✗

Hot Nebula → {Cloud of Gas}

Nebular Hypothesis. (Nebula)

[Youthful Sun →

? Planet ? ⇒

IMMANUEL KANT

LAPLACE

EARLY THEORIES

- Nebular Hypothesis
- Given by German philosopher Immanuel Kant
- Mathematician Laplace revised it in 1796 .

The hypothesis considered that-

- The planets were formed out of a cloud of material.
- Associated with a youthful sun.
- Which was slowly rotating.

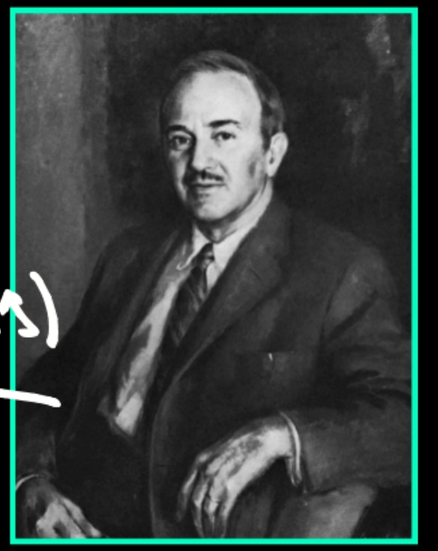
EARLY THEORIES

- Intially it was the accepted, because no other theory existed at that time.
- Platentesinal Theory
- In 1905, Chamberlain and Moulton gave Platentesinal hypothesis.

The hypothesis considered that-

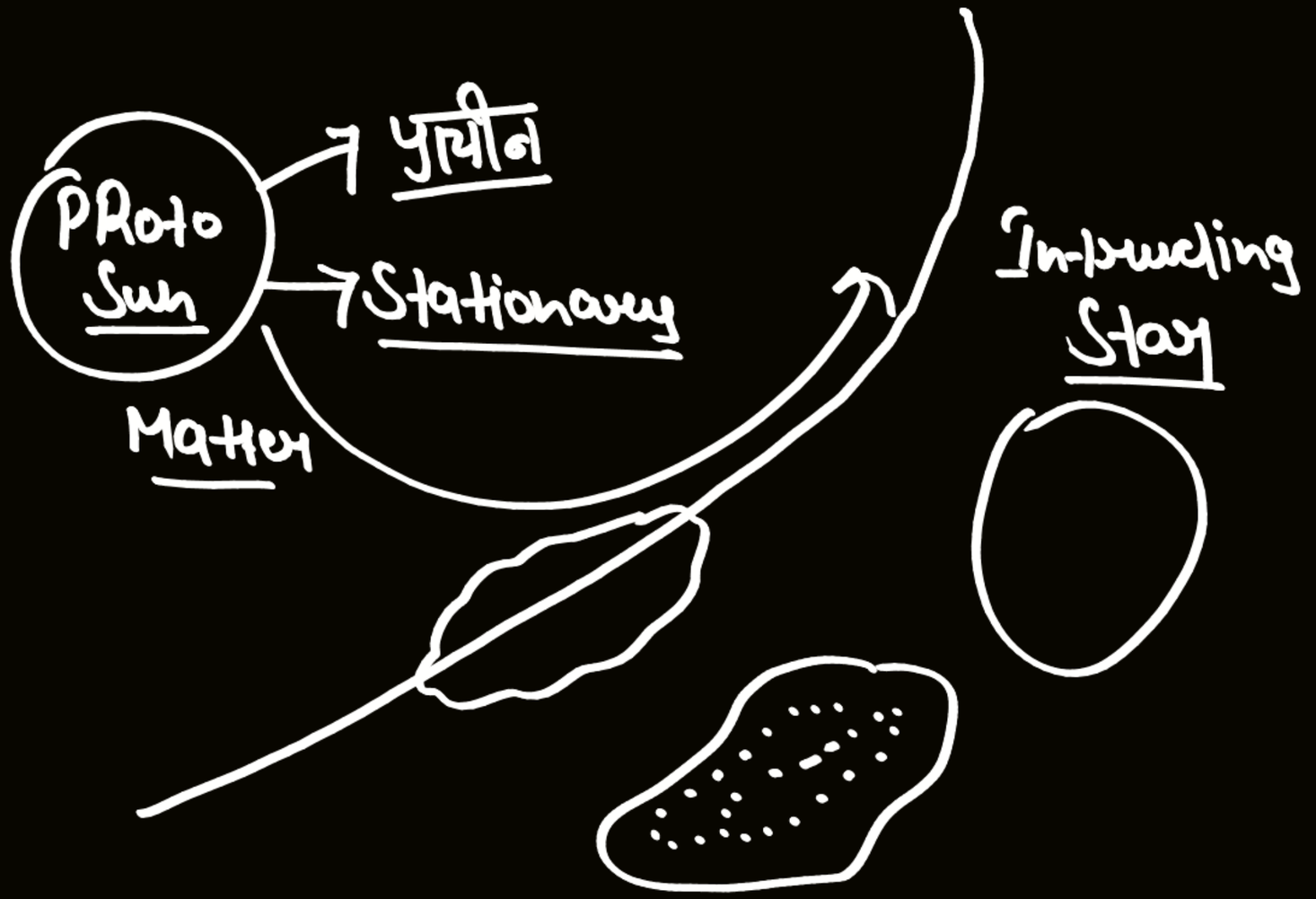
IMPORTANT

- Wandering star (intruding star) approached the sun.
- As a result, a cigar-shaped extension of material was separated from the Solar Surface.
- As the passing star moved away, the material separated from the Solar Surface continued to revalue around the sun and it slowly condensed into planets.



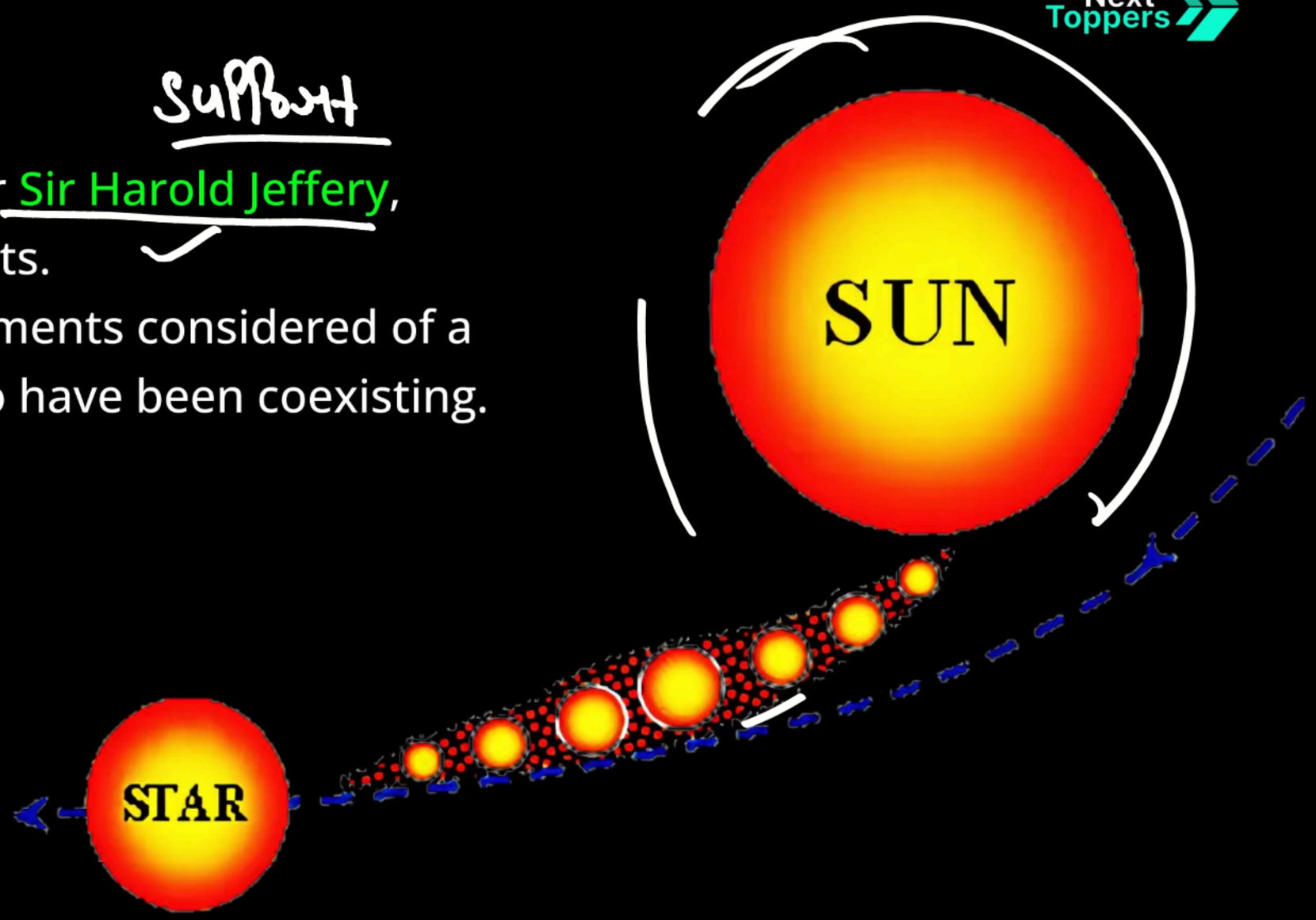
Chamberlain

Moulton


Proto Sun
पृथ्वी
Stationary
Matter
Including Stay

EARLY THEORIES

- Sir James Jeans and later Sir Harold Jeffery, supported this arguments.
- At a later date, the arguments considered of a companion to the sun to have been coexisting.



Hypothesis:

① Immanuel Kant (1755)

② Laplace (1796)

③ Chamberlin & Moulton

④ James Jeans
Harrold Jefferys

Hypothesis:
↳ Based Proof

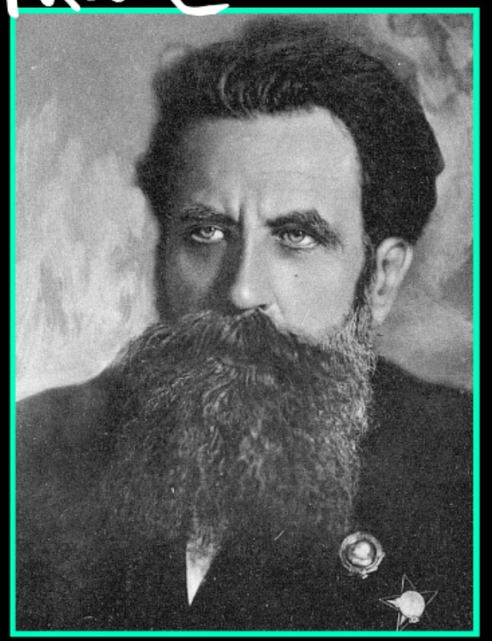
→ Theories: Defined

EARLY THEORIES

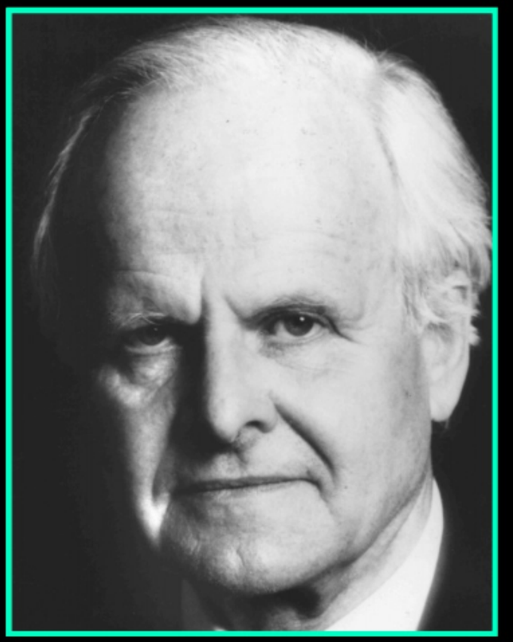
Nebular Hypothesis → Laplace → Hot

Binary Theories:

- In 1950, Otto Schmidt and Carl Weizascar somewhat revised the 'Nebular Hypothesis'.
- They considered that the sun was surrounded by solar nebula containing mostly the hydrogen and helium along with what may be termed as dust.
- The fiction and collision of particles led to formation of a disk-shaped-cloud and the planets were formed through the process of accretion.



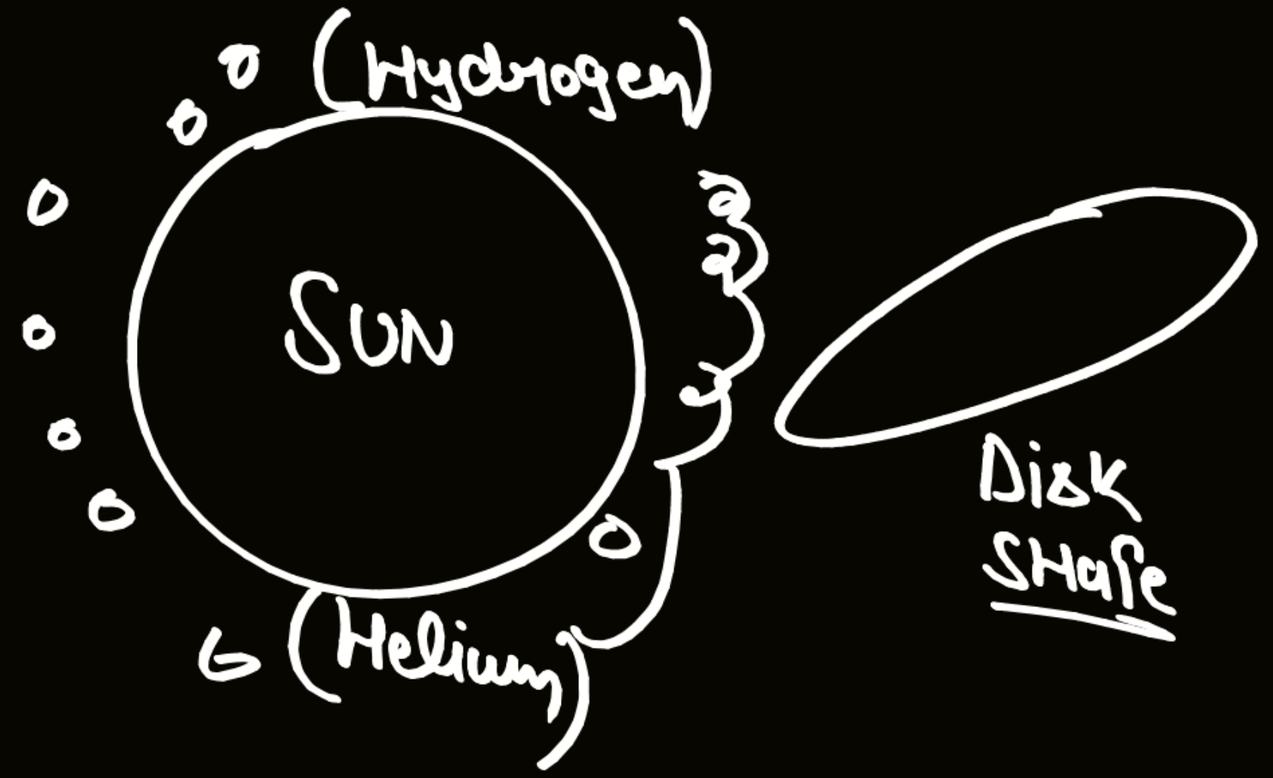
Otto Schmidt

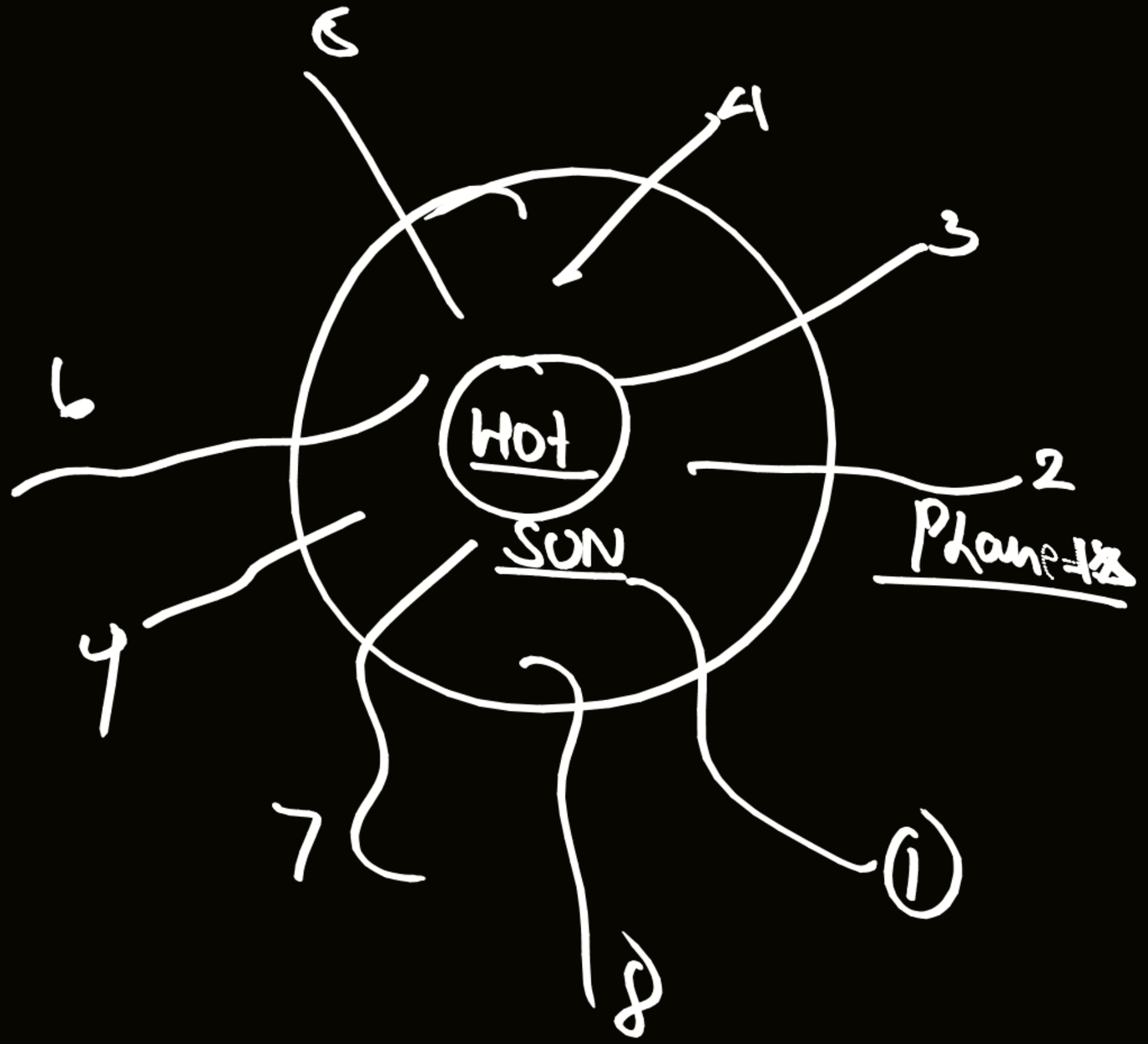


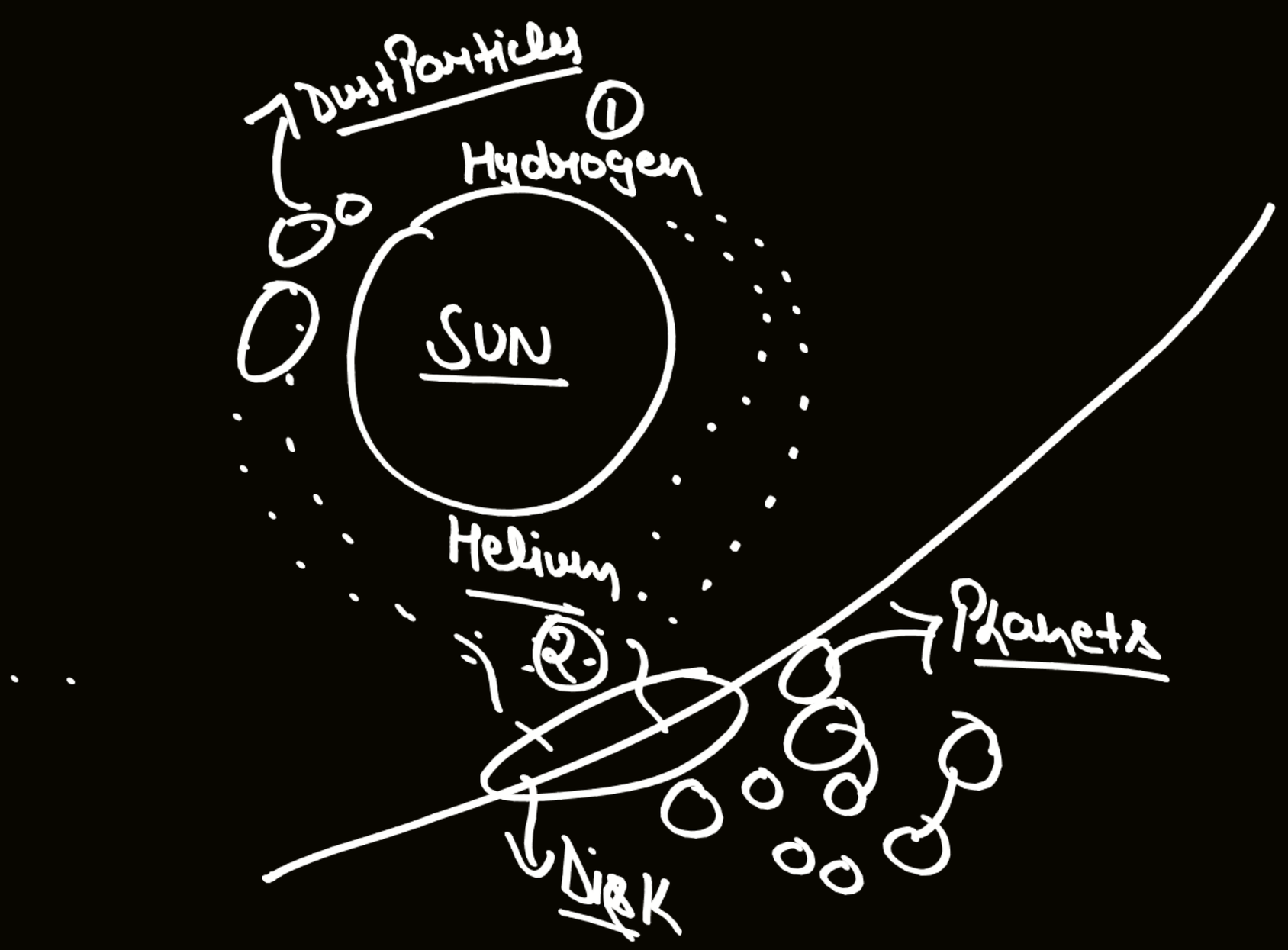
Carl Weizascar

Digvijay Singh

PRASHANT

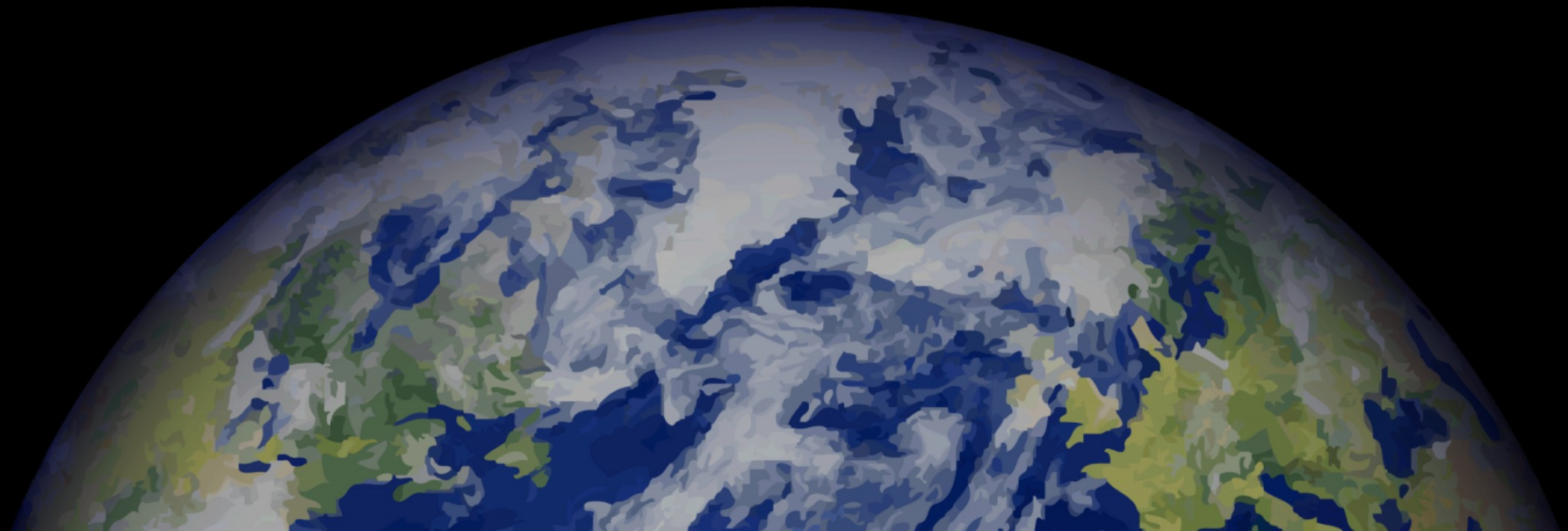

(Hydrogen)
SUN
(Helium)
Disk
Shape


5
4
3
6
Hot
SUN
2
Planets
4
7
8
1


Dust Particles
1
Hydrogen
SUN
Helium
2
Planets
Disk

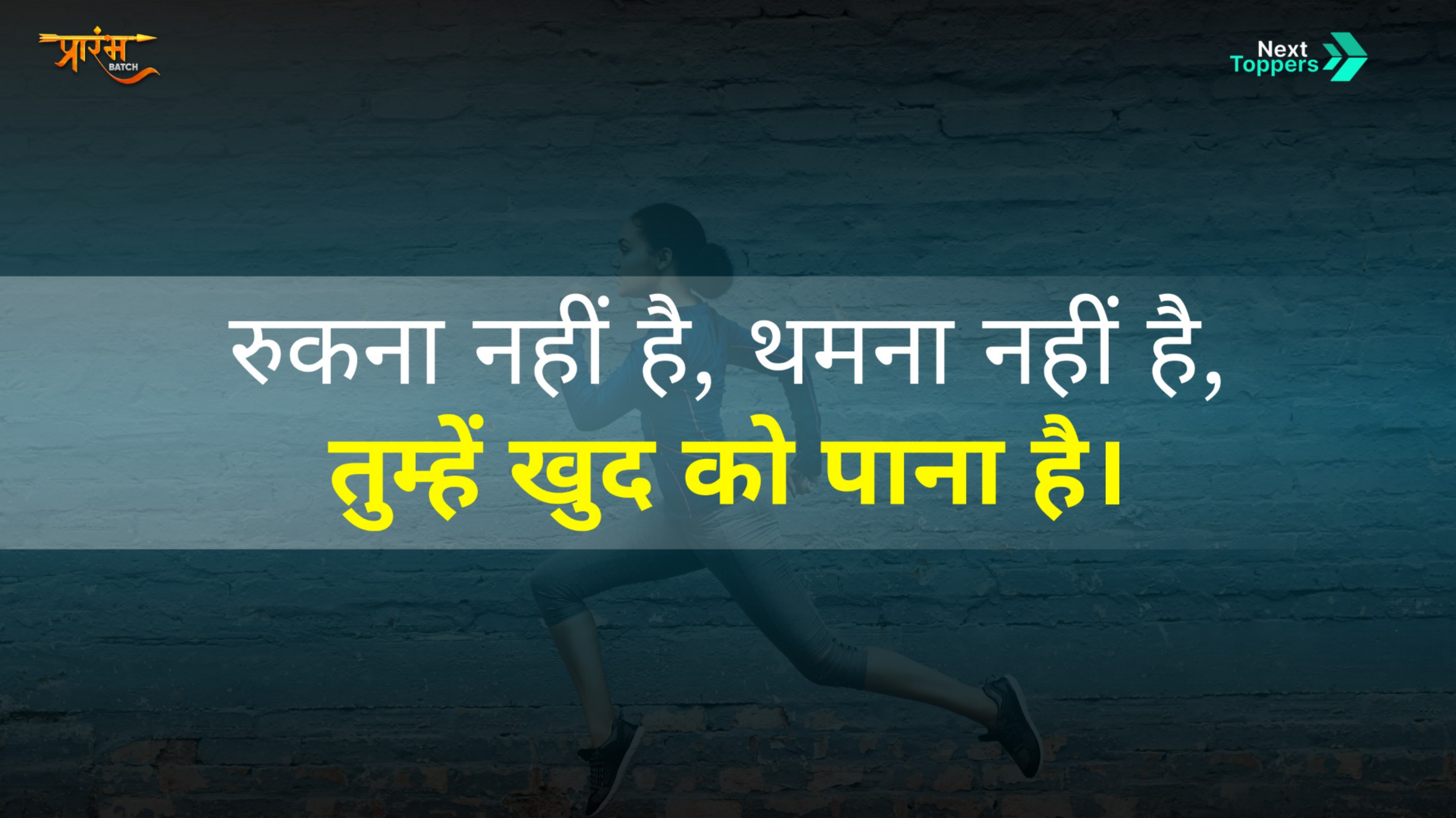
THE EARTH

- Drawbacks of Early Theories
- Talks about earth but not about universe.



WHY DO WE STUDY EARLY THEORIES?

- They have shaped our thinking about the origin of planets.


प्रारंभ
BATCH
Next Toppers
रुकना नहीं है, थमना नहीं है,
तुम्हें खुद को पाना है।

STAY CONNECTED

KEEP LEARNING

Thank You

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