

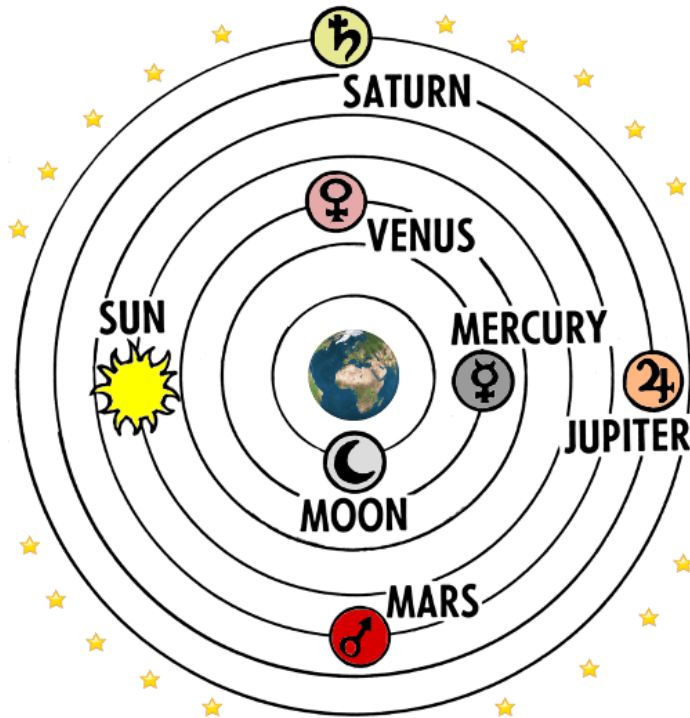
# Solar System Part 1



**Can you name the planets?**

# Solar System: historical models

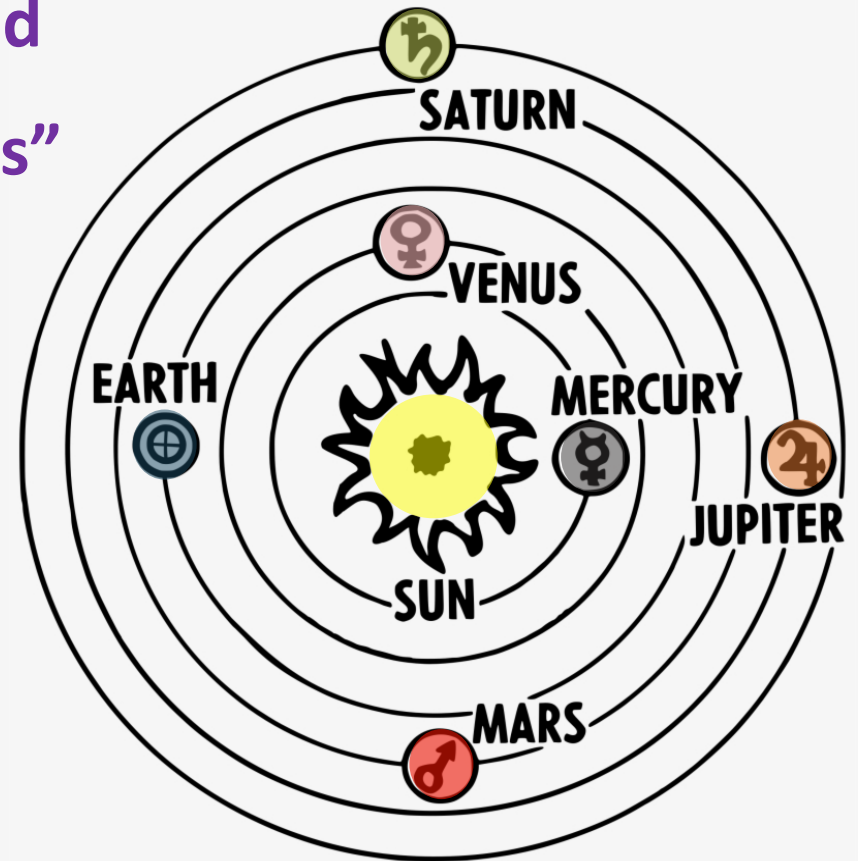
“naked  
eye  
planets”



## Geocentric

Aristotle (~350 BC),  
Ptolemy (2<sup>nd</sup> century)

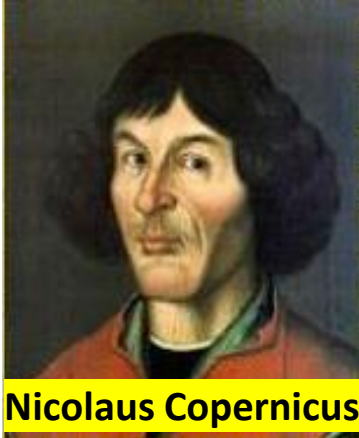
VS



## Heliocentric

Aristarchus (~350 BC), Nicolaus Copernicus  
(15-16<sup>th</sup> century), Galileo Galilei, Johannes  
Kepler, Isaac Newton (16-17<sup>th</sup> century)

# Solar System: Renaissance



Nicolaus Copernicus

Heliocentrism



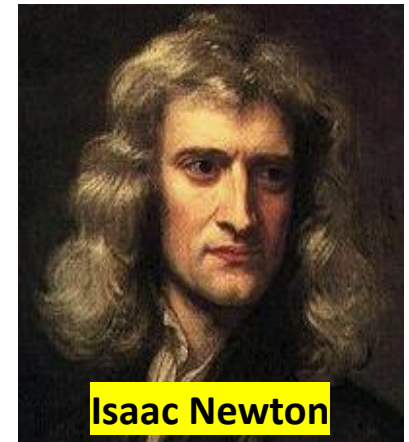
Tycho Brahe

*Data!*



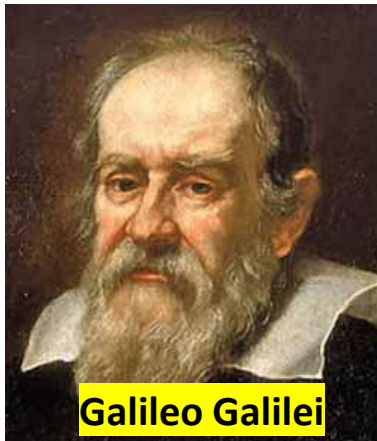
Johannes Kepler

Formulated three laws of planetary motion.



Isaac Newton

Formulated the laws of motion and universal gravitation.



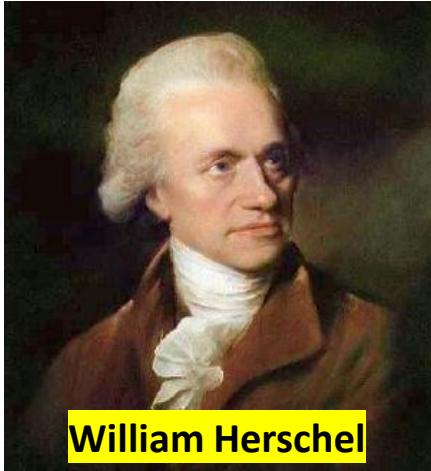
Galileo Galilei

- Discovered four large moons of Jupiter (*bodies that did not orbit Earth*).
- Observed all phases of Venus (*not possible in Geocentric model*) and rotation of the Sun.





# Solar System: Modern Astronomy

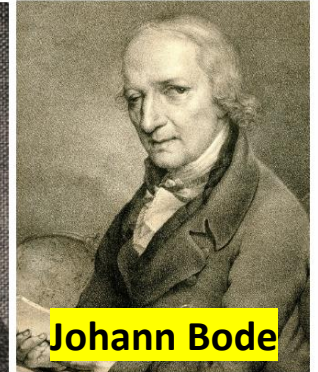


William Herschel

- Discovered *Uranus* and two of its moons.
- Created a catalog of over 2500 nebulae.
- Proposed theory of stellar evolution.
- Discovered IR light.

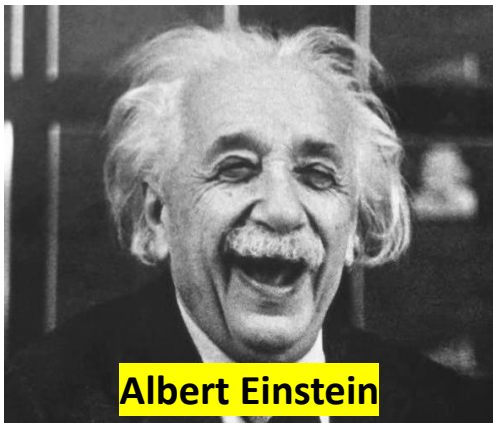


Johann Titius



Johann Bode

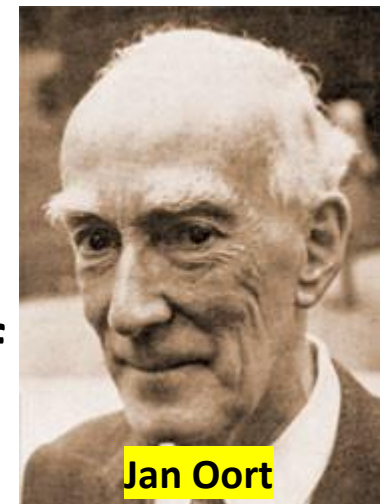
*Empirical Bode-Titius Law helped discover the asteroid belt.*



Albert Einstein

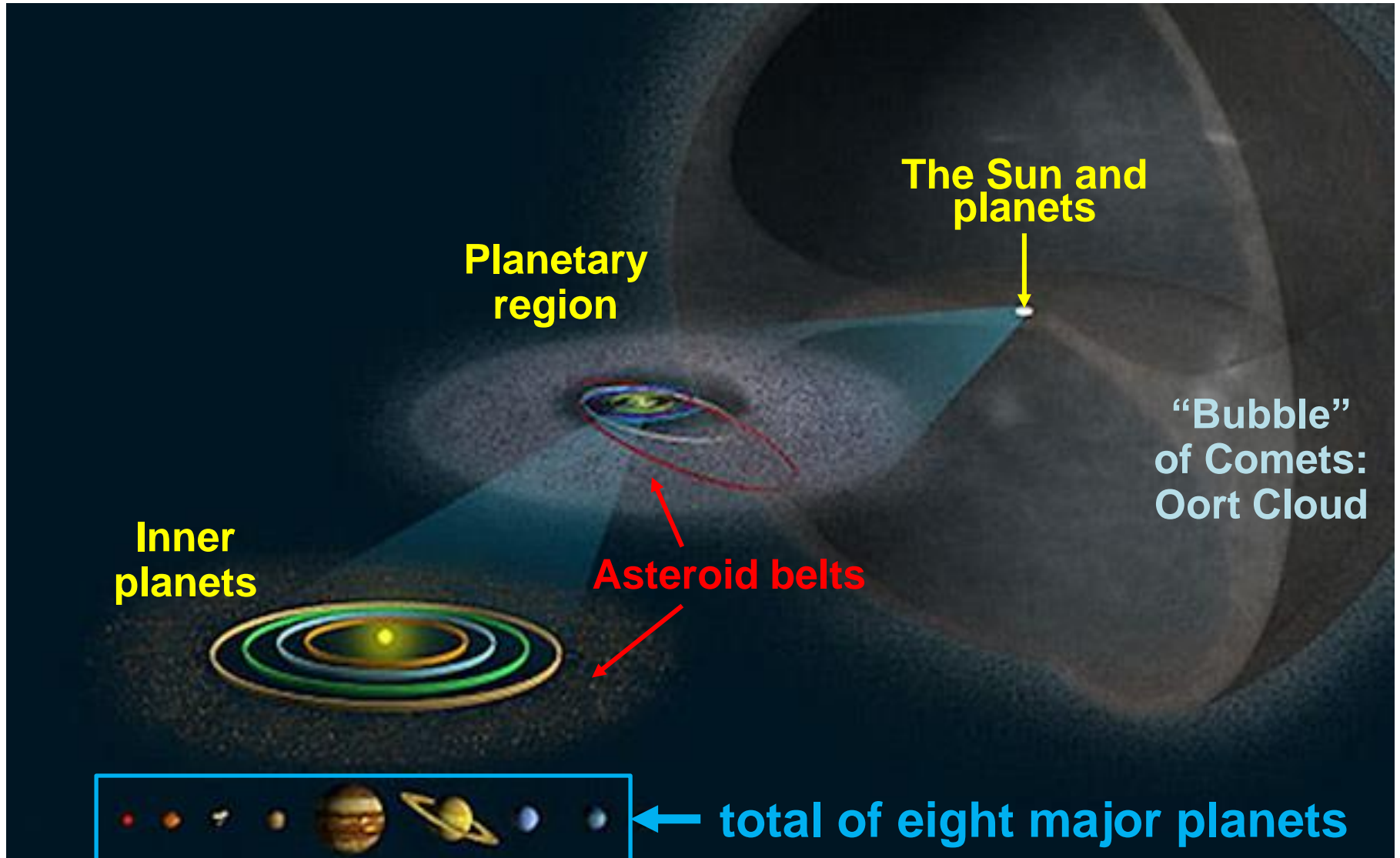
**General Theory of Relativity** helped explain the peculiar orbit of Mercury.

Theorized the existence of a vast *cloud of comets* at the Solar System's edge.



Jan Oort

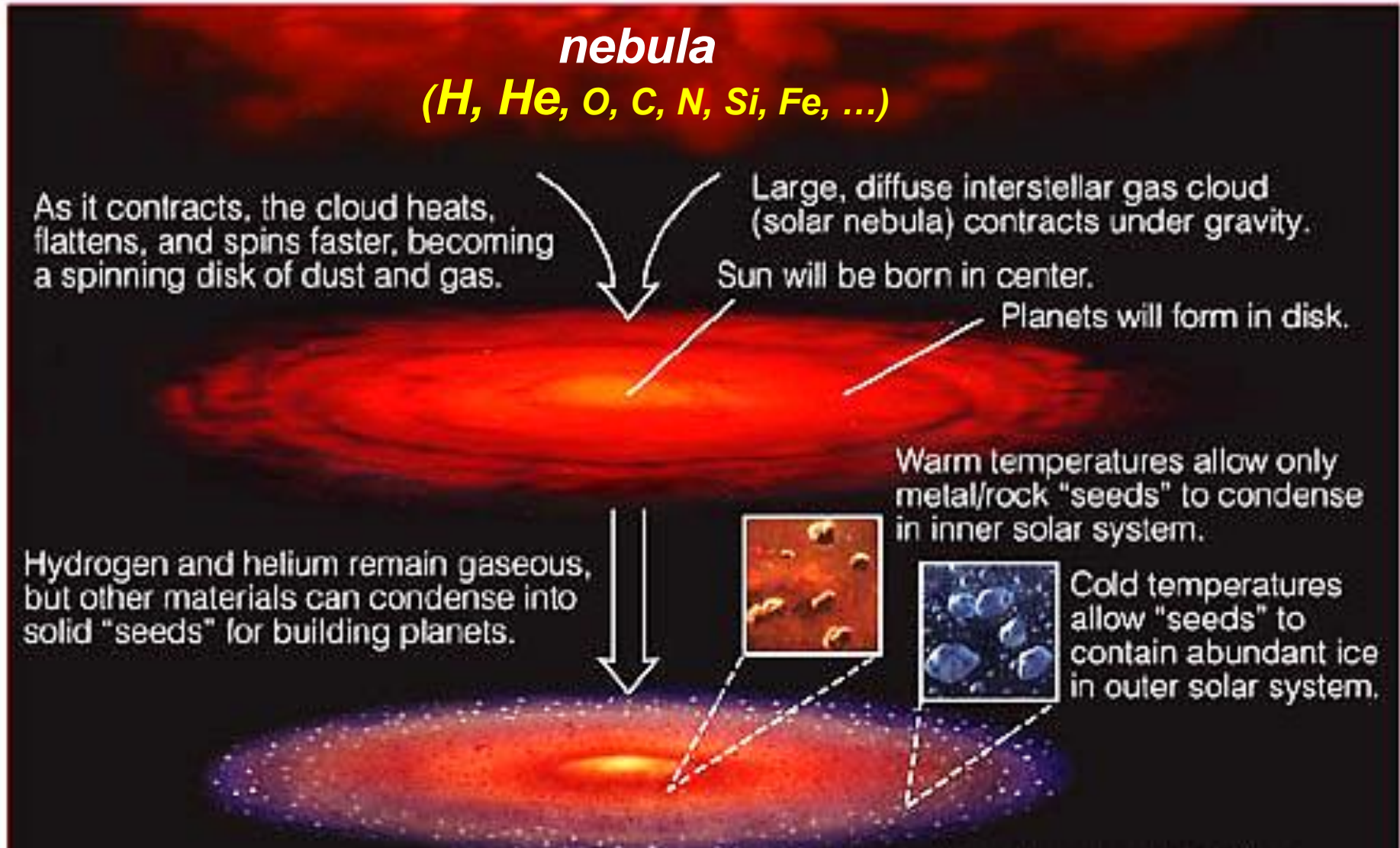
# Solar System: architecture



# The Formation of the Solar System

(~4.6 billion years ago)

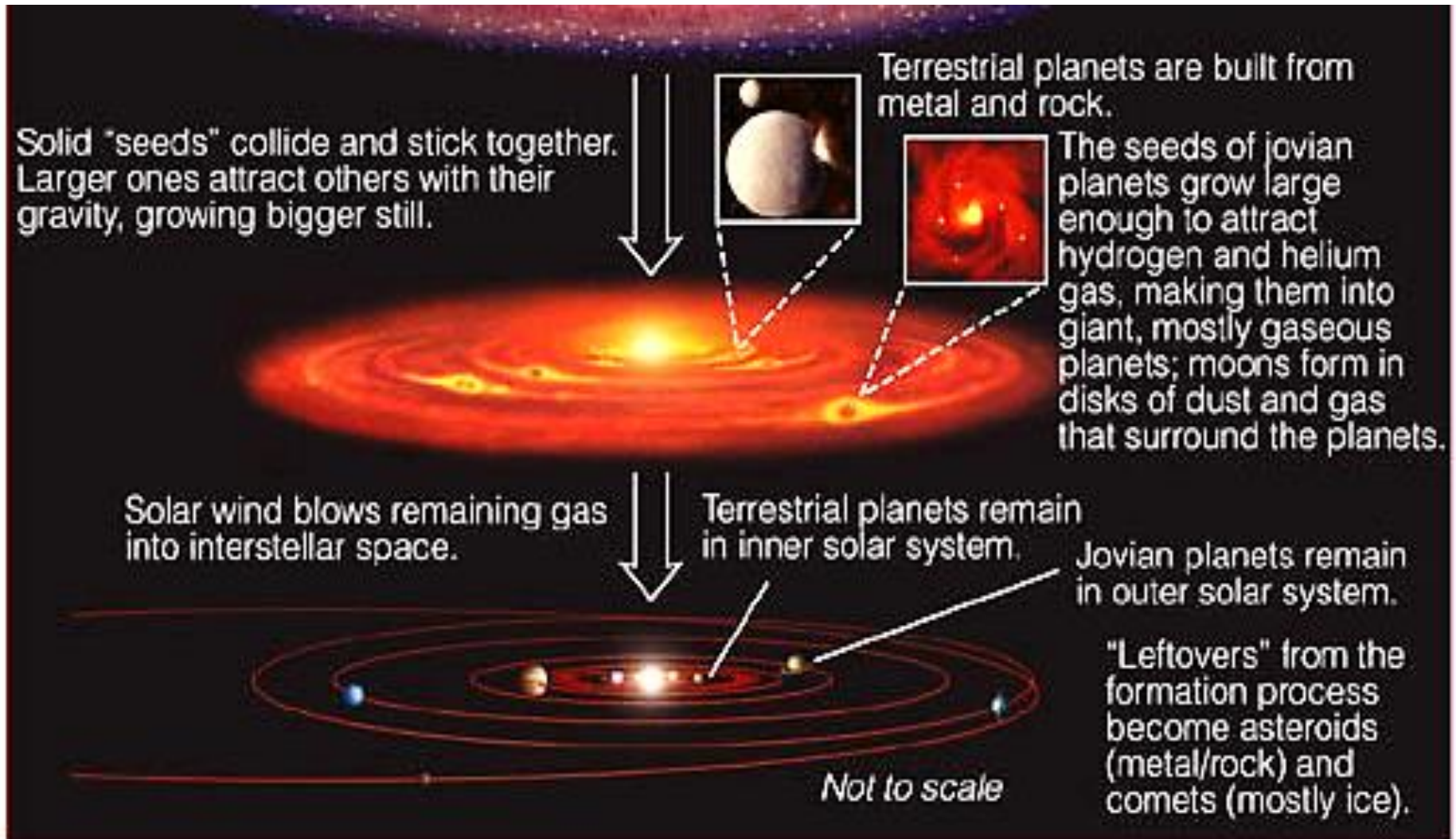
## *Nebular Hypothesis*





# The Formation of the Solar System

The Sun, planets, moons, comets, asteroids are believed to form within 50-100 million years.



# Solar System: inventory

- **Sun**                    **99.85%** by mass
- **Planets**                **0.1 %** by mass
- **Satellites** (“moons”) and **Rings** of planets
- **Asteroids** (“minor planets”, small *rocky* bodies orbiting the Sun)
- **Comets** (small *icy* bodies orbiting the Sun)
- **Meteoroids** (rocky or metallic bodies smaller than 1 m)
- **Dust** (very small particles)
- **Solar Wind** (ionized gas escaping the Sun)