

Astronomy

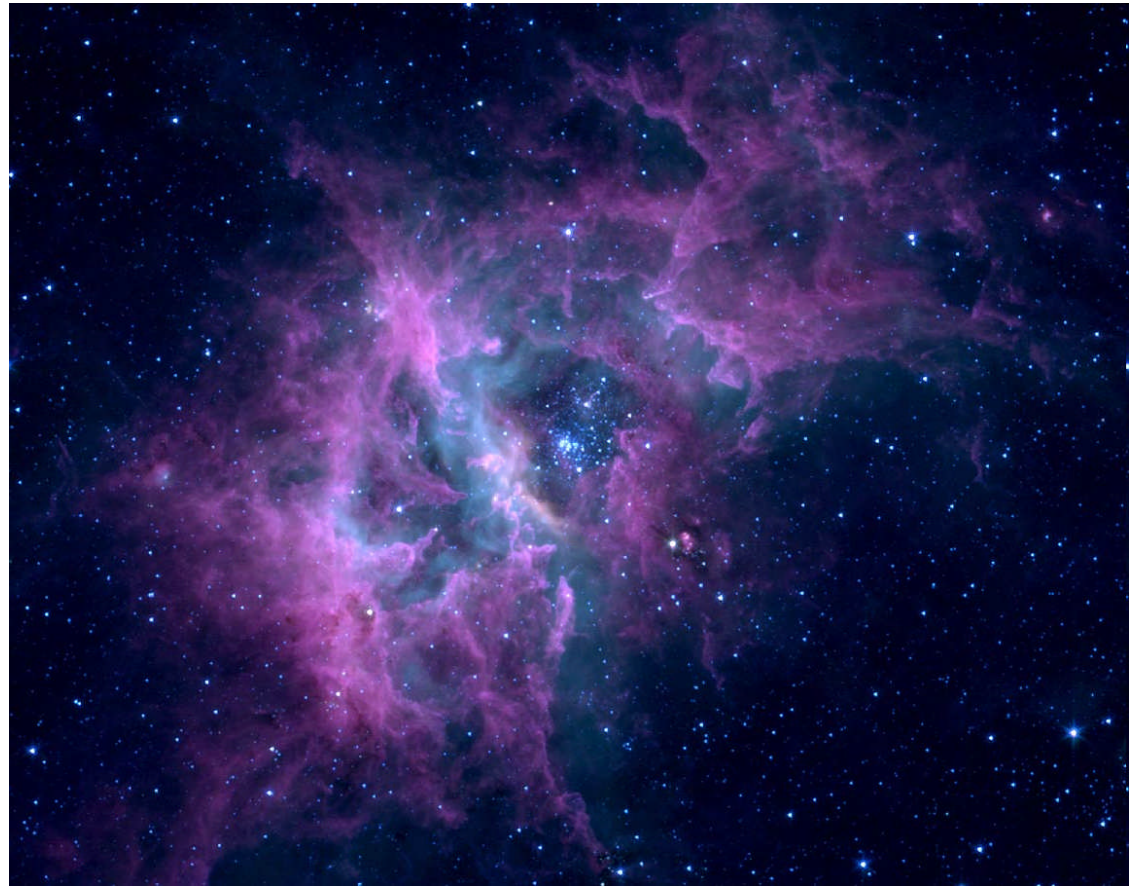
The Short Version

I. Solar System Formation

In the beginning...

- 4.6 billion years ago, a **nebula** existed where our solar system exists today.

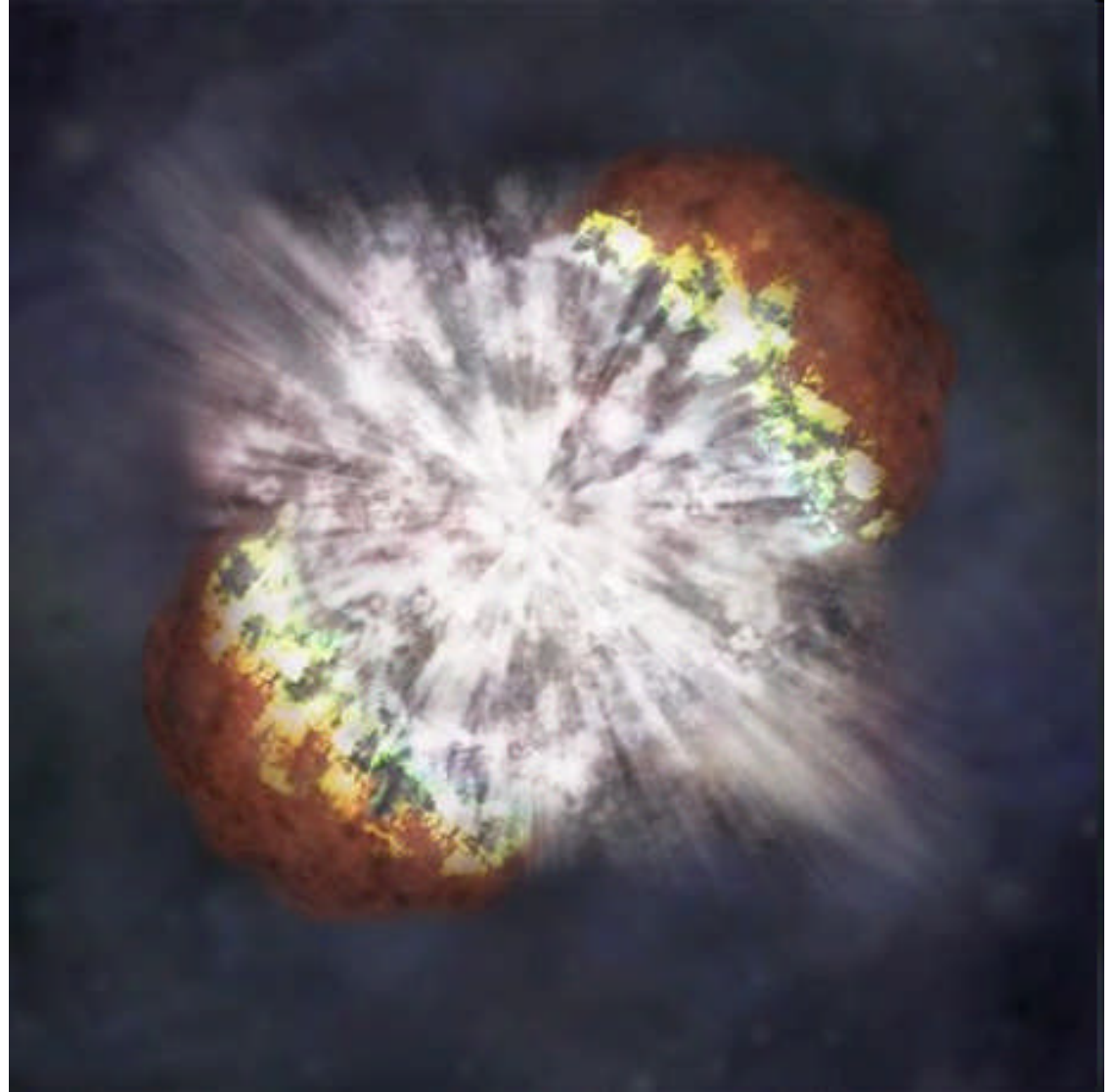
Nebula: A cloud of gas and debris, mostly hydrogen and helium.



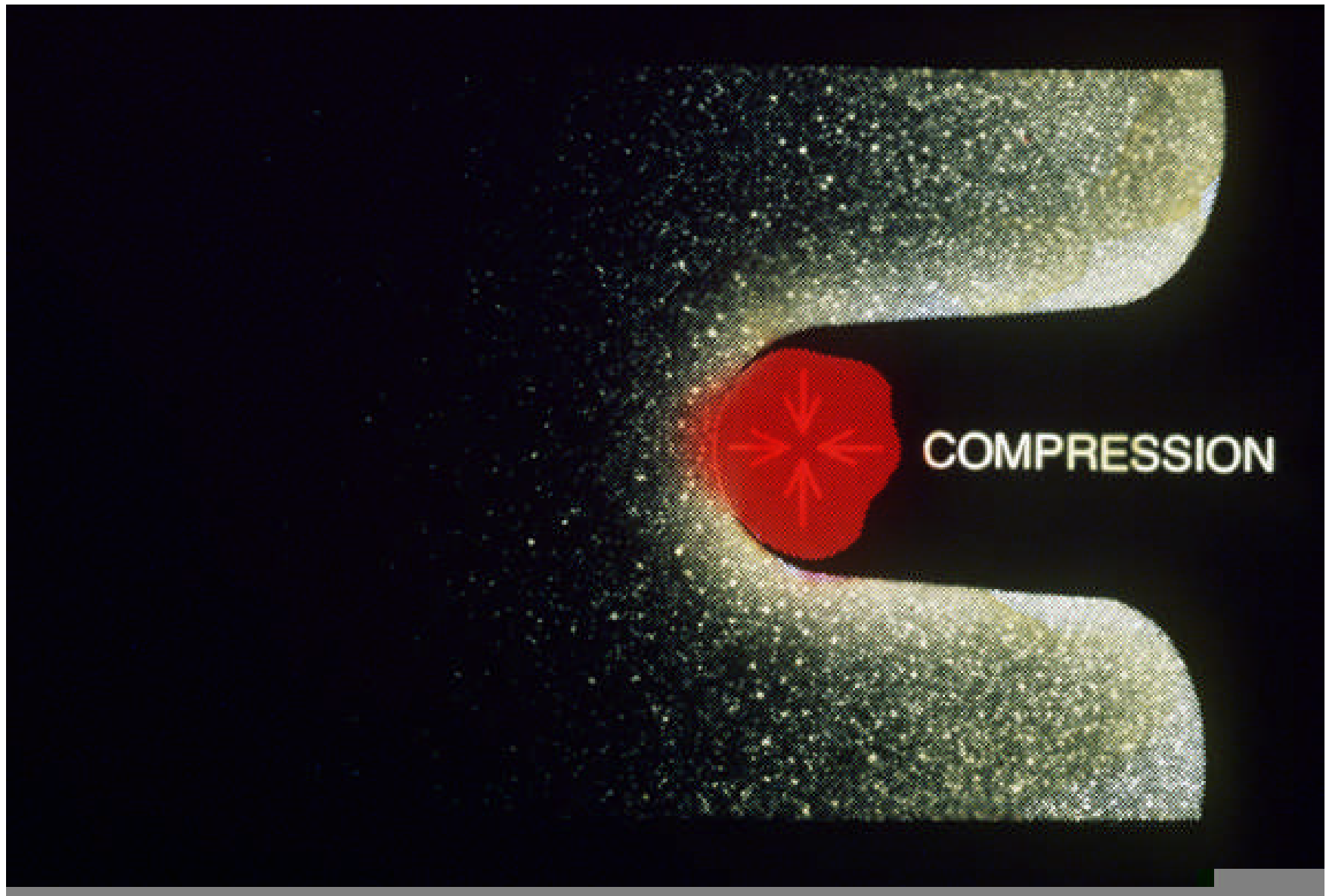
1 Billion = 1,000 Million

Somewhere nearby...

- There was an old, dying star that exploded called a **supernova**.



Stardust ejected from the supernova caused the nebula cloud to collapse.



- The collapse lead to heating, an increase in rotation rate, and flattening into a disk.



- Due to gravity, the heavier chunks of debris gravitated toward the center of the disc.
- Less massive chunks expanded out toward the perimeter.



Our solar system is composed of:

- The sun in the center.
- 4 inner, rocky (terrestrial) planets.
- 4 outer, gaseous (Jovian) planets.



II. The Early Earth

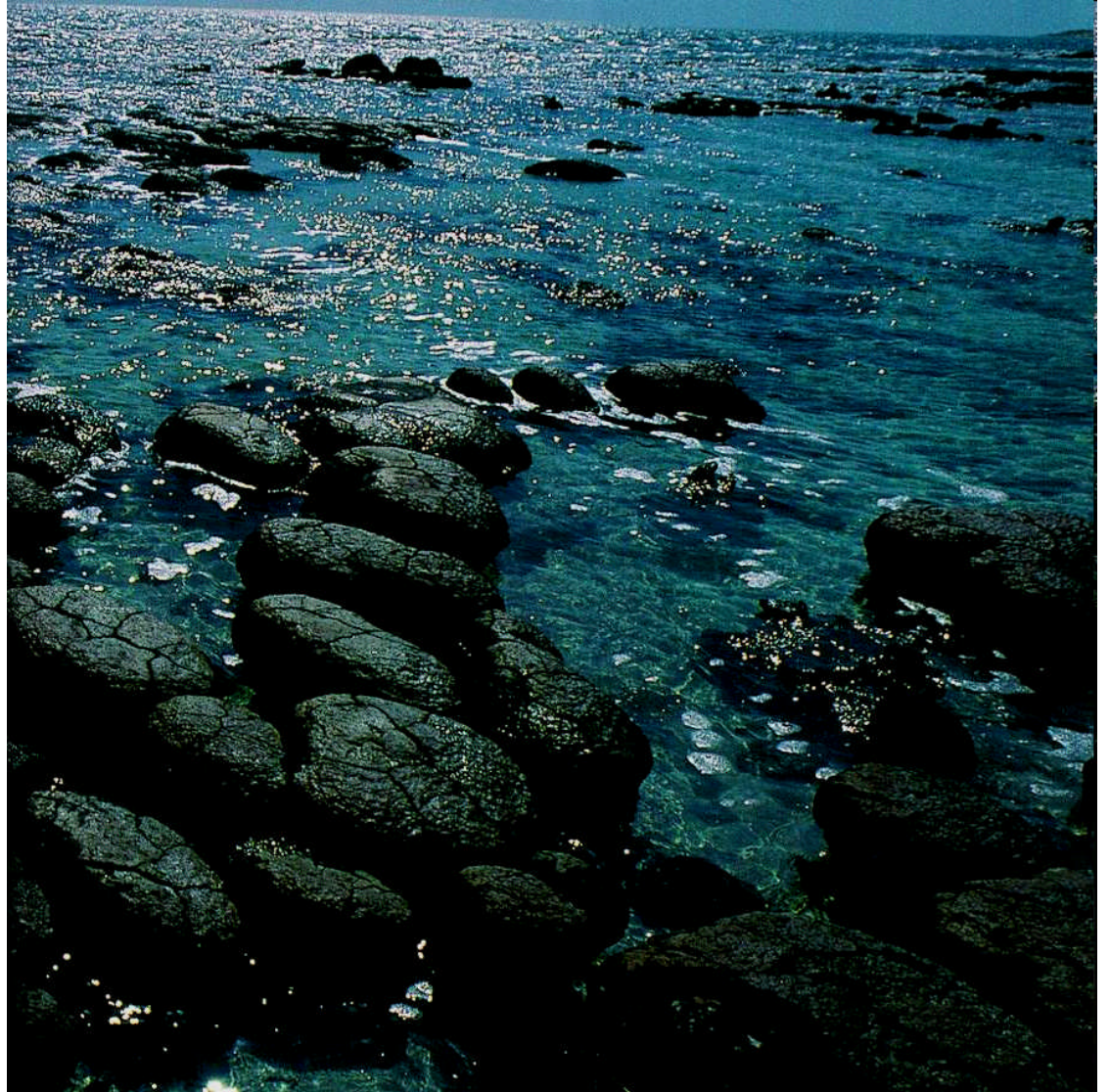
- At first, the Earth was a molten ball of rock.
- The Earth slowly grew larger as debris in the solar system (asteroids) collided with Earth.



- As the Earth cooled, denser materials (Fe, Ni, U) sunk to the core and less dense materials (Si, C, N) floated to the surface.
- The early atmosphere was mainly composed of volcanic gases (i.e. carbon dioxide, water vapor, sulfuric acid, and nitrogen).



- 1.5 billion years ago, photosynthetic bacteria started adding oxygen to the atmosphere.

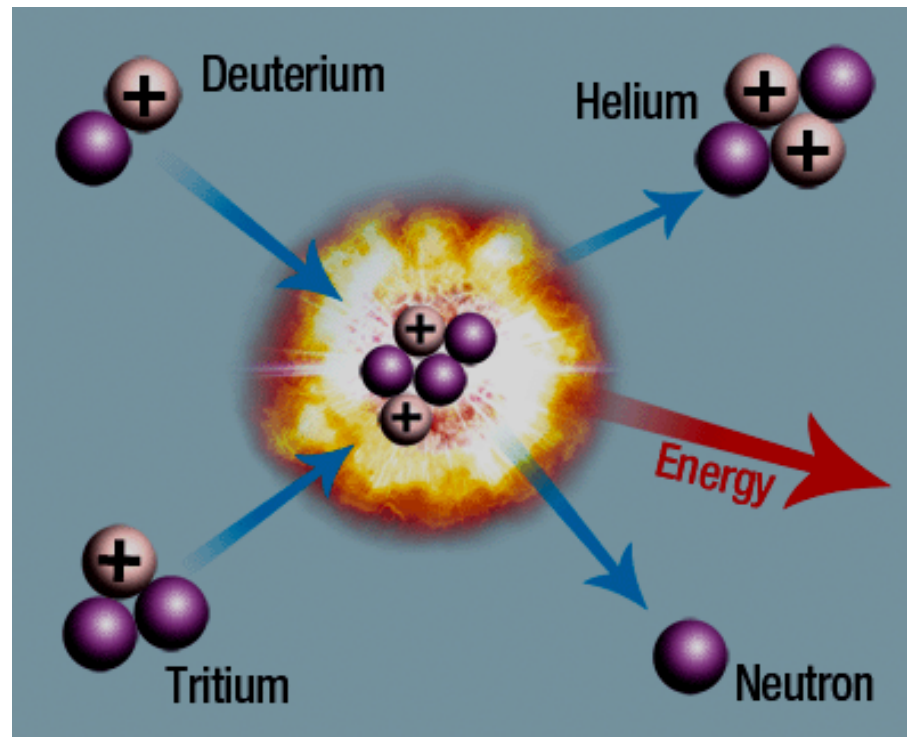


III. Stars, Planets, Moons

- Stars, like our sun, produce their own light.
- Planets and moons reflect light from their surface.
- Planets orbit stars and moons orbit planets.

IV. The Sun

- Mostly composed of hydrogen.
- Energy produced is the result of a nuclear fusion reaction that squeezes two hydrogen atoms together to form helium.



- All the elements on the periodic table were formed by nuclear fusion reactions within stars.

VI. Galaxies

- Our sun is but one star out of billions of stars in the Milky Way galaxy.
- There are billions of galaxies in the universe.

Galaxies are classified by shape

- Spiral
- Elliptical
- Irregular

SPIRALS



ELLIPTICALS

