# Classifying Galaxies Activity

# THE FORMATION OF OUR SOLAR SYSTEM

# The Milky Way and Our Solar System

## Types of Galaxies and The Milky Way's characteristics:

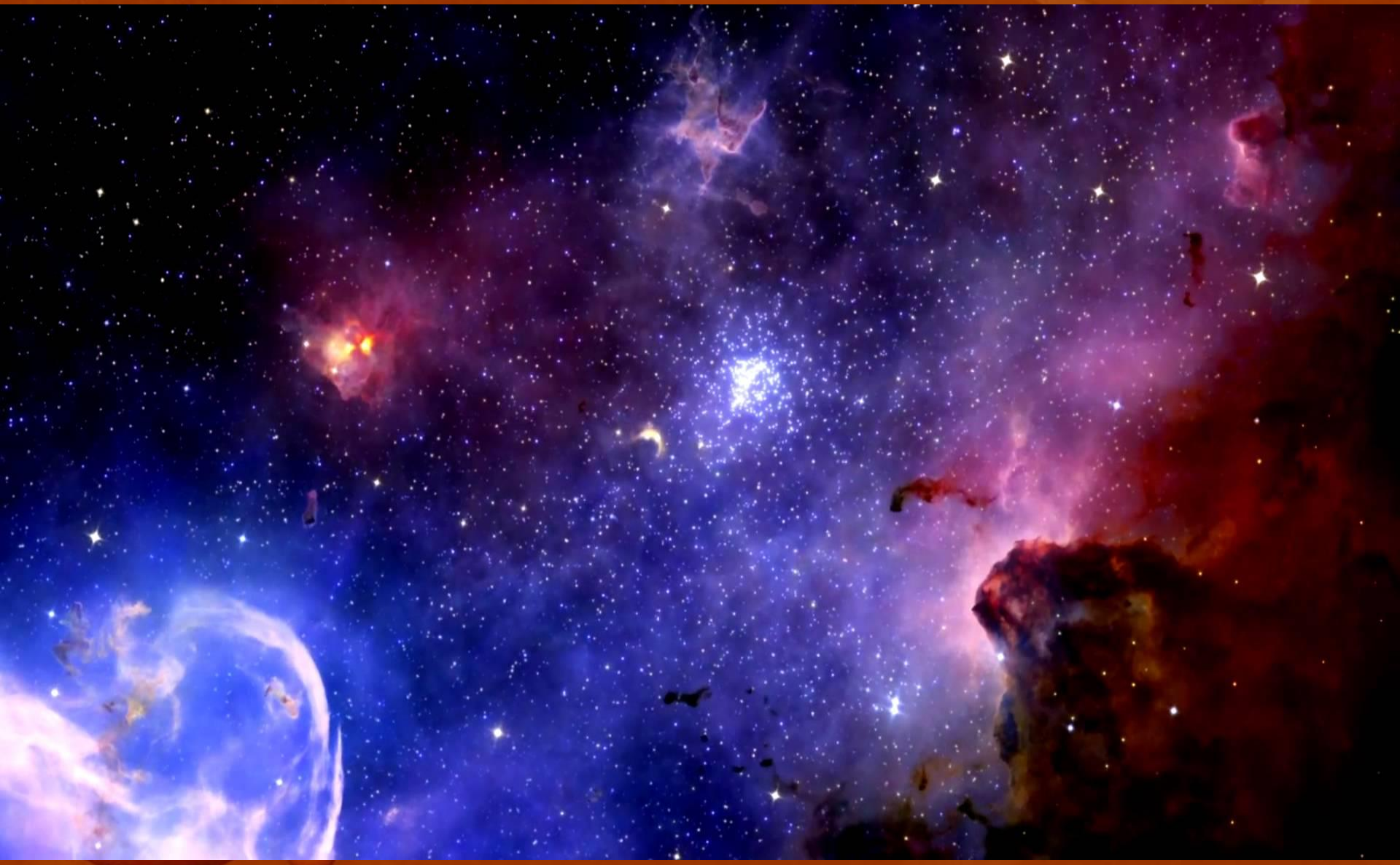
## How the solar system was formed:

## The 411 on the solar system:

**The Universe contains billions of galaxies, each containing millions or billions of stars.**

**Therefore, the galaxy in which our solar system and essentially all of us live, is just one of billions.**

# The Great Beyond



# Types of Galaxies

**Spiral**: disk shape with a spherical bulge at its center. Has "arms" which are made up of bright bands of stars. Example: Andromeda (nearest major galaxy to the Milky Way)

# Types of Galaxies

**Elliptical:** Have no spiral arms and usually no obvious disk. They have a central dense nucleus. Circular or oval shape. Most abundant type of galaxy, and can be larger than spiral.

# Types of Galaxies

The Milky Way

**Barred**: spirals show the same spiral structure as normal spirals, and also

a prominent bar through the nucleus. The spiral arms emerge from the

end of the bar.

# Types of Galaxies

**<u>Irregular:</u>** Certain galaxies lack either an obvious spiral structure or nuclear bulge, appearing instead as a random collection of stars with no obvious order.

# The Milky Way Galaxy

- Contains single star systems, double star systems, and dust and gas
- It is a barred galaxy because it has spiral arms that wind outward from the bar-like center

# The Milky Way Galaxy

- It is over 13 billion years old
- It has a black hole at its center
- Contains over 100 billion planets
- It is over 100,000 light years across. The sun is 93,000,000 miles away from the Earth and is only 10 light years away…

# The Milky Way Galaxy

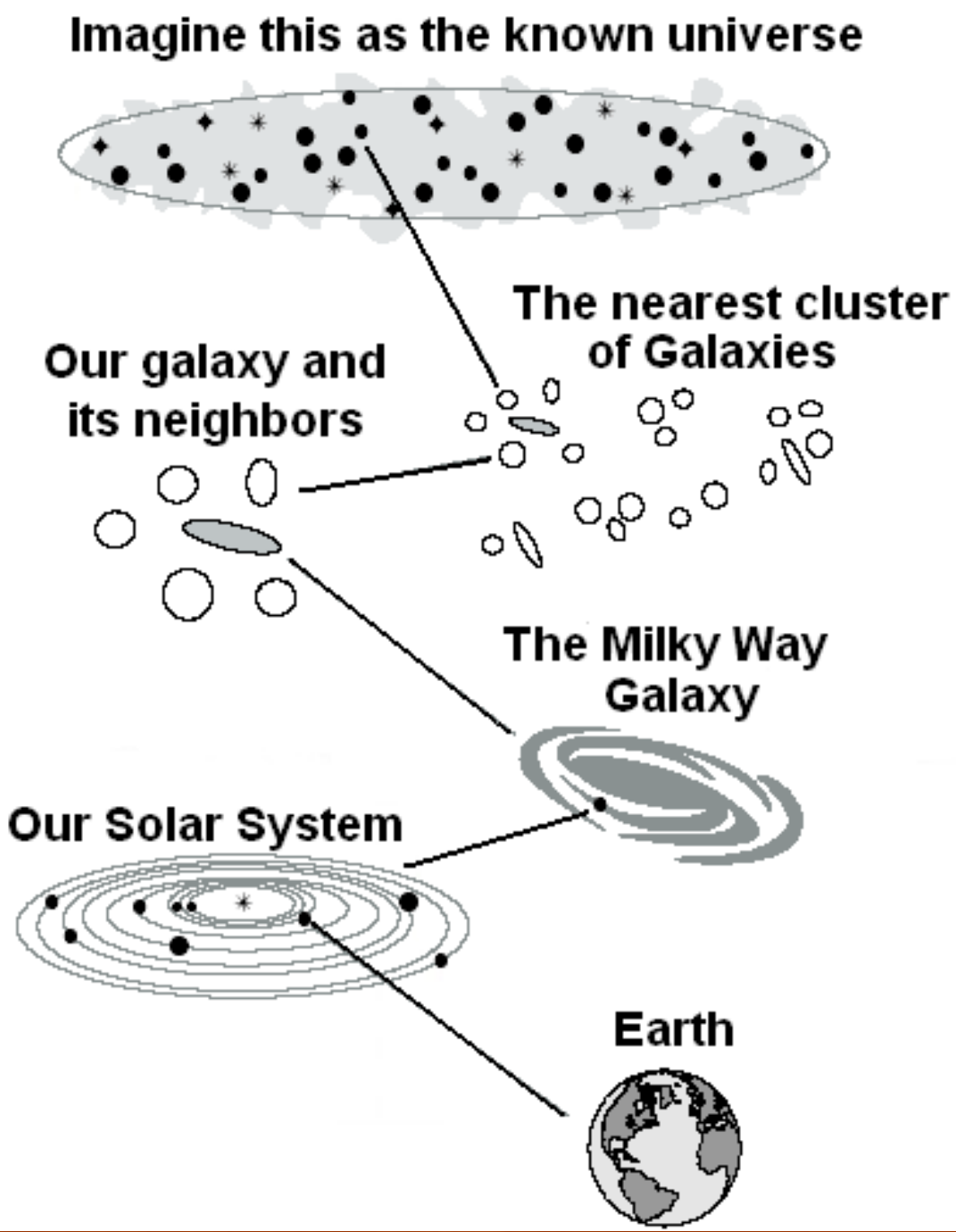
- It contains over 300 Billion stars. Most of those stars have planets orbiting them.
- We estimate its size at 1,000,000,000,000,000,000 KM. That is 3.2 billion-billion-billion Earth's!

# Why is it Called the Milky Way?

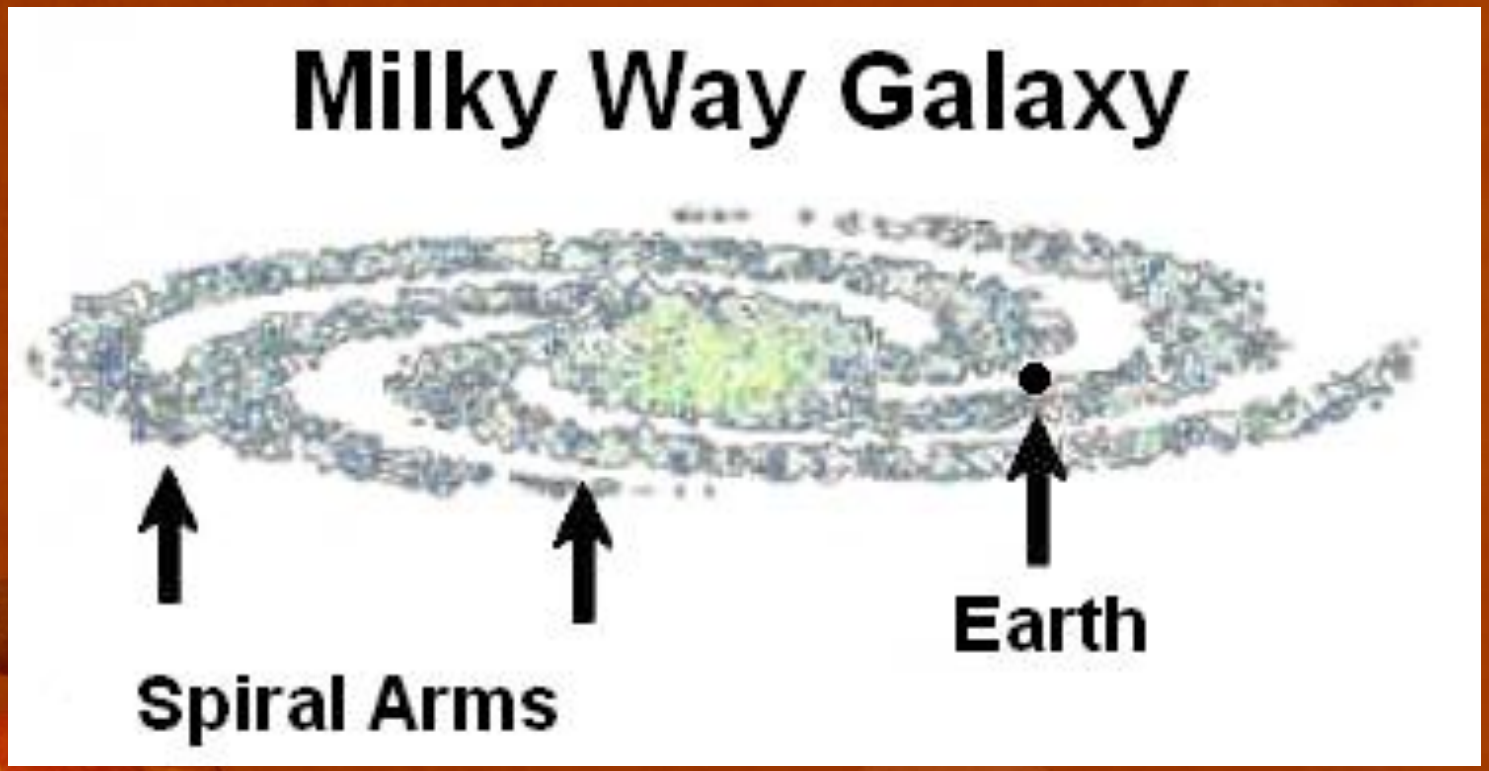
- Thousands of years ago people thought the stars appeared as a patchy band of light like a flowing river of milk, thus the name Milky Way.
- Also, the word galaxy comes from the Greek word gala, meaning milk.

# Our solar system

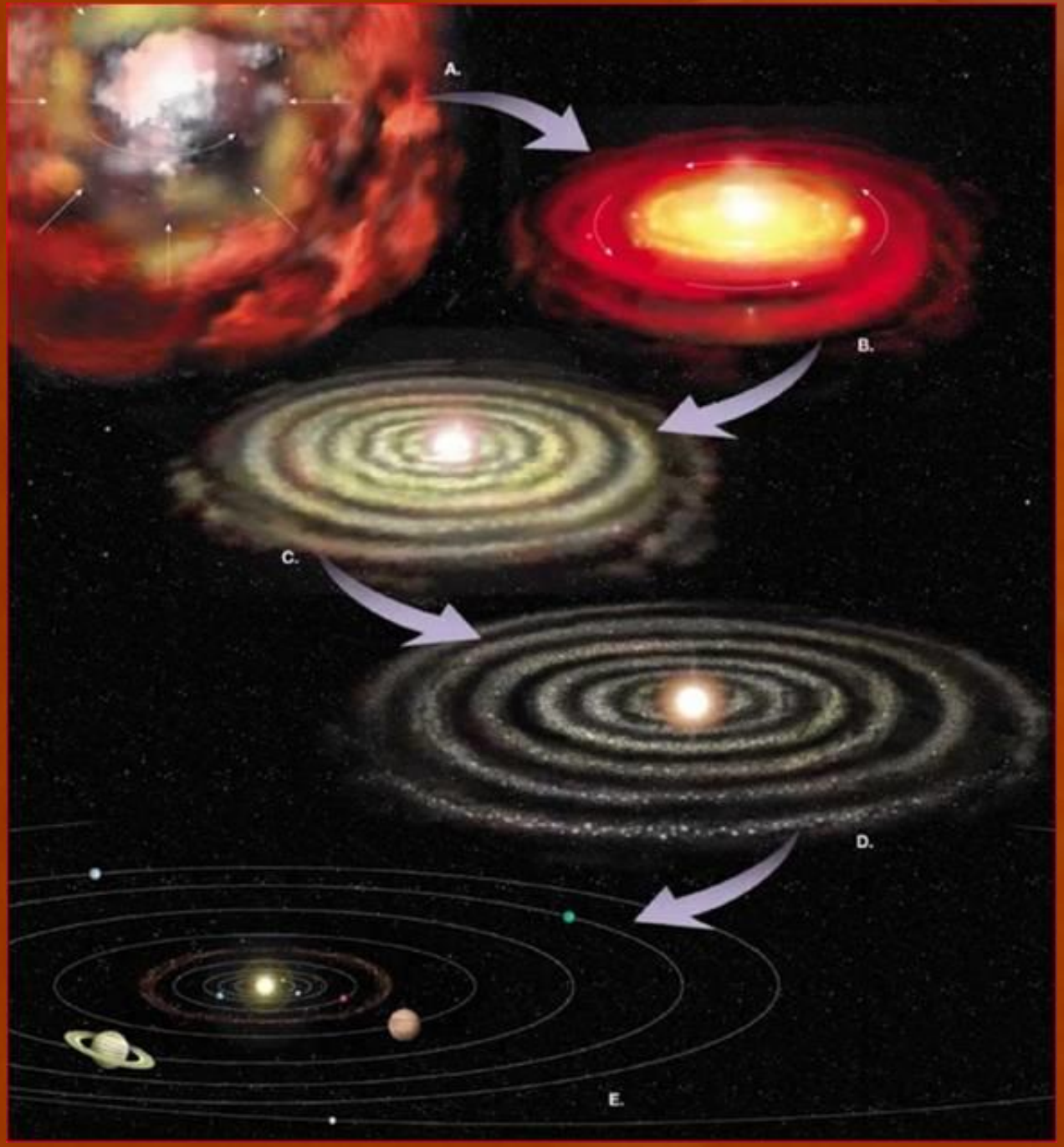
Our solar system is a single star system located on an outer rim (arm) of the Milky Way Galaxy.



# Our solar system



# Solar System Formation



# The Formation of a Solar System

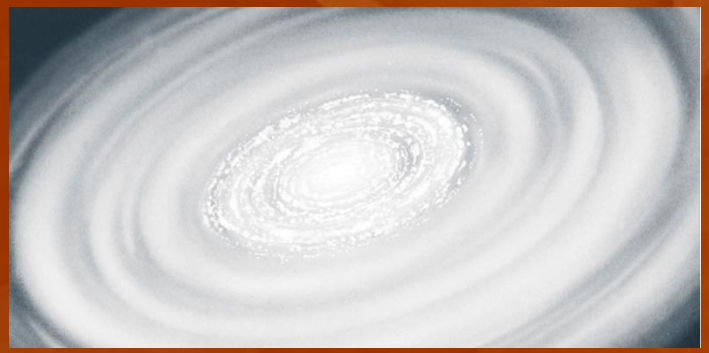
A solar system begins as a gas cloud that collapses toward the center under the influence of gravity.

A condensation forms at the center, which is called a protostar.

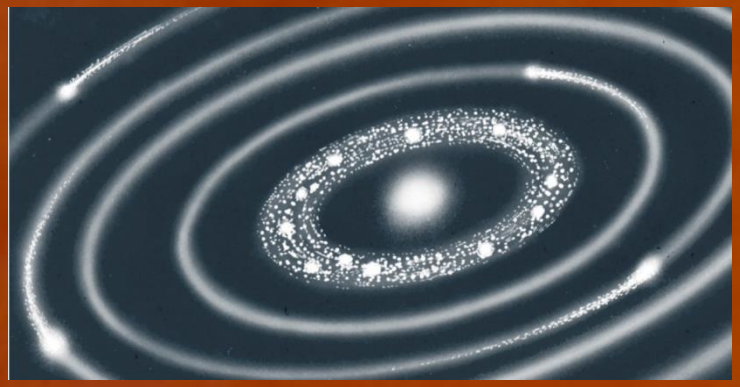
A flattened disk of matter surrounds the protostar, which begins to shine.

# The Formation of a Solar System

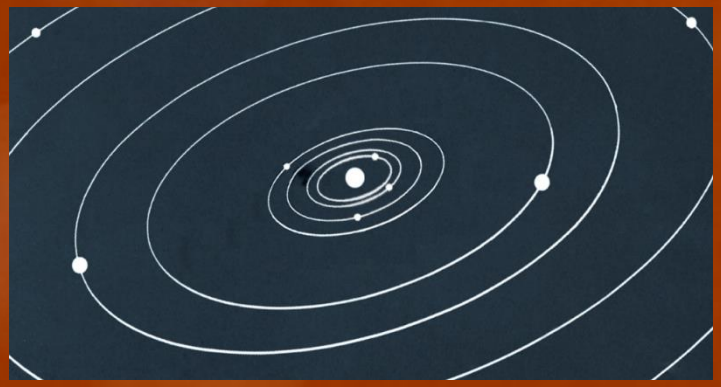
The rising temperature from the sun removes the gas from the inner regions, leaving dust and larger debris.

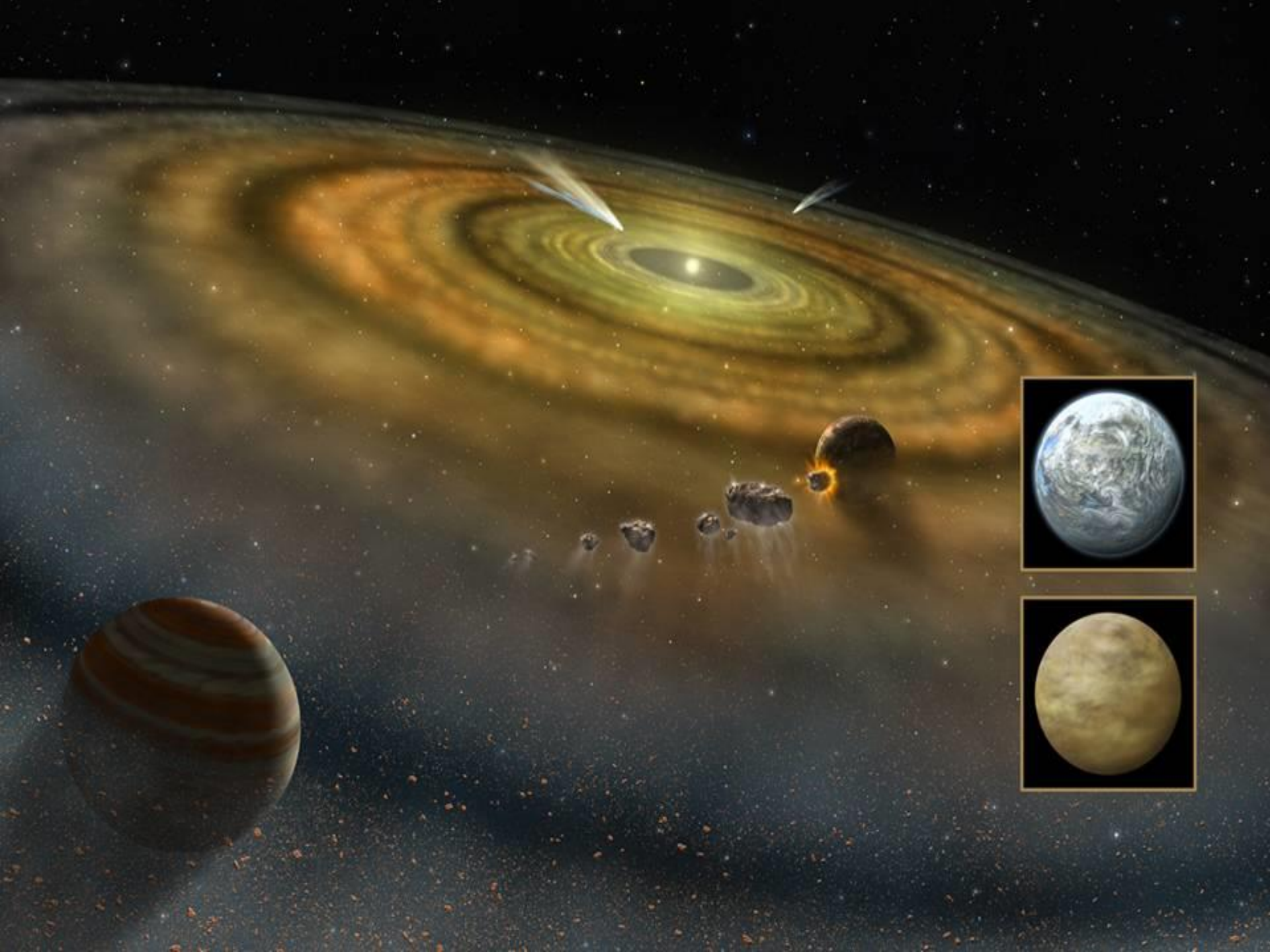


The planets establish dominance in their regions of the solar system.



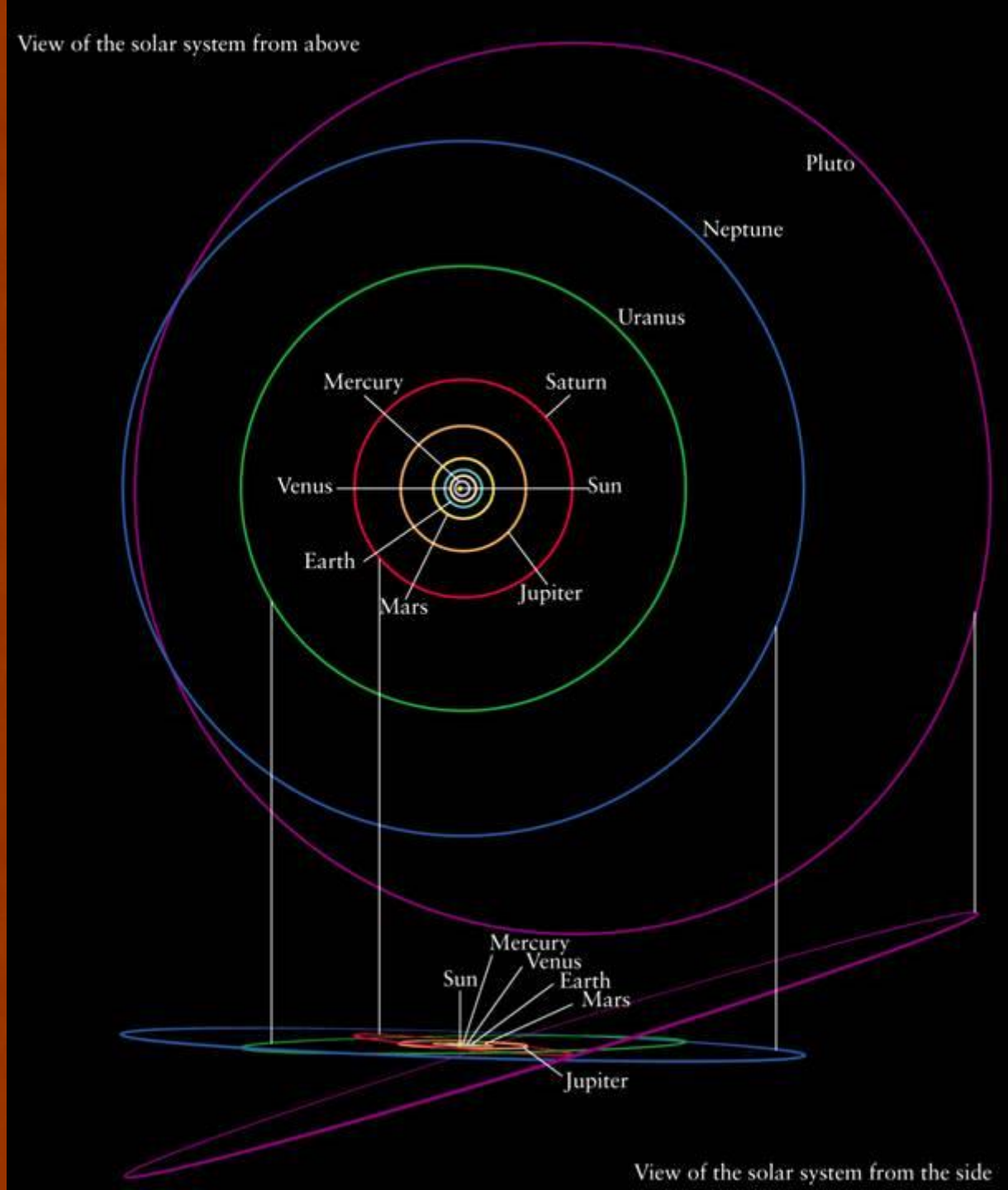
After almost all of the remaining gas, dust, and small debris has been collected by the larger objects, the solar system takes on the form we recognize today.





# Our Solar System

- As viewed from above, all of the planets orbit the Sun in a counter-clockwise direction.



- Planets and moons which have no atmosphere show scars from impacts with planetary debris, called craters.

- Asteroids—rocky bodies several kilometers across which orbit the sun—are found mainly in the asteroid belt located between the orbits of Mars and Jupiter.
- Even smaller rocky objects, called meteoroids, are scattered throughout the solar system.
- Billions of chunks of rock and ice called comets are located beyond the orbit of Neptune. Occasionally, one of these will be pulled toward the inner solar system and form the familiar “tails” as it orbits close to the Sun.

# Two Basic Groups of Planets

**TERRESTRIAL**

Small size

Low Mass

Higher density

Mostly rock

Mercury, Venus, Earth, Mars

**JOVIAN**

Large size

Massive

Low density

Mostly gas

Jupiter, Saturn, Uranus, Neptune