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Milky way galaxy & Solar
system

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Assi.Prof. G.S.Pawar
Dept.of Physics
P.D.V.P.College Tasgaon
416312 Maharashtra
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WHAT IS A GALAXY?

A Galaxy is basically a large group of stars, gas and dust held together by gravity. This is the simplest definition of a galaxy.



The Milky Way



- ✦ It has about 200 billion stars, and lots of gas and dust.
- ✦ It's about 100,000 light-years wide.
- ✦ A large group of stars outside of our own Milky Way.
- ✦ Made of billions to trillions of stars.
- ✦ Also it has gas and dust Spiral, or elliptical, or irregular shaped.

THE MILKY WAY GALAXY: CONTINUED

The Milky Way is the only galaxy to be recorded to have a planet with life, although there are billions of galaxies out there, earth is the main one. Scientist have found the age of the Milky Way, since our Sun is about 5 billion year old, the galaxy is at least 5 billion more years old (So roughly about 10 billion years old) Our Milky Way is between about 750 billion-1 trillion solar masses and is about 10,000 light years in diameter. Our galaxy is very unique and we are lucky to have it. From earth to the solar system, all the way to the black hole. Our galaxy is changing every day.



What is a Galaxies?

- ❑ It come in different sizes like (dwarf, large, giant)
- ❑ It come in different shapes and classifications.
 - Spirals
 - Elliptical
 - Irregulars

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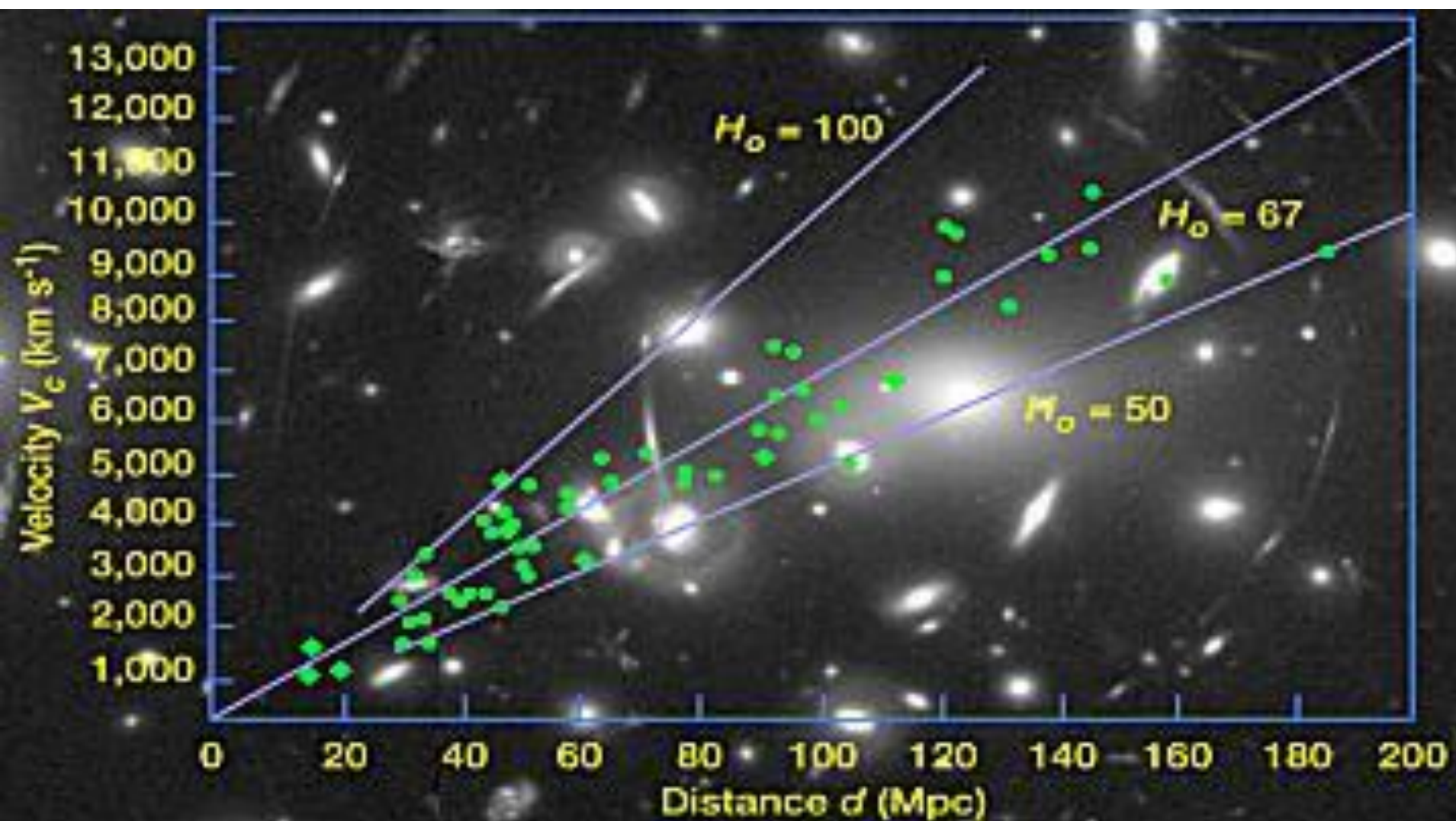
Irregular

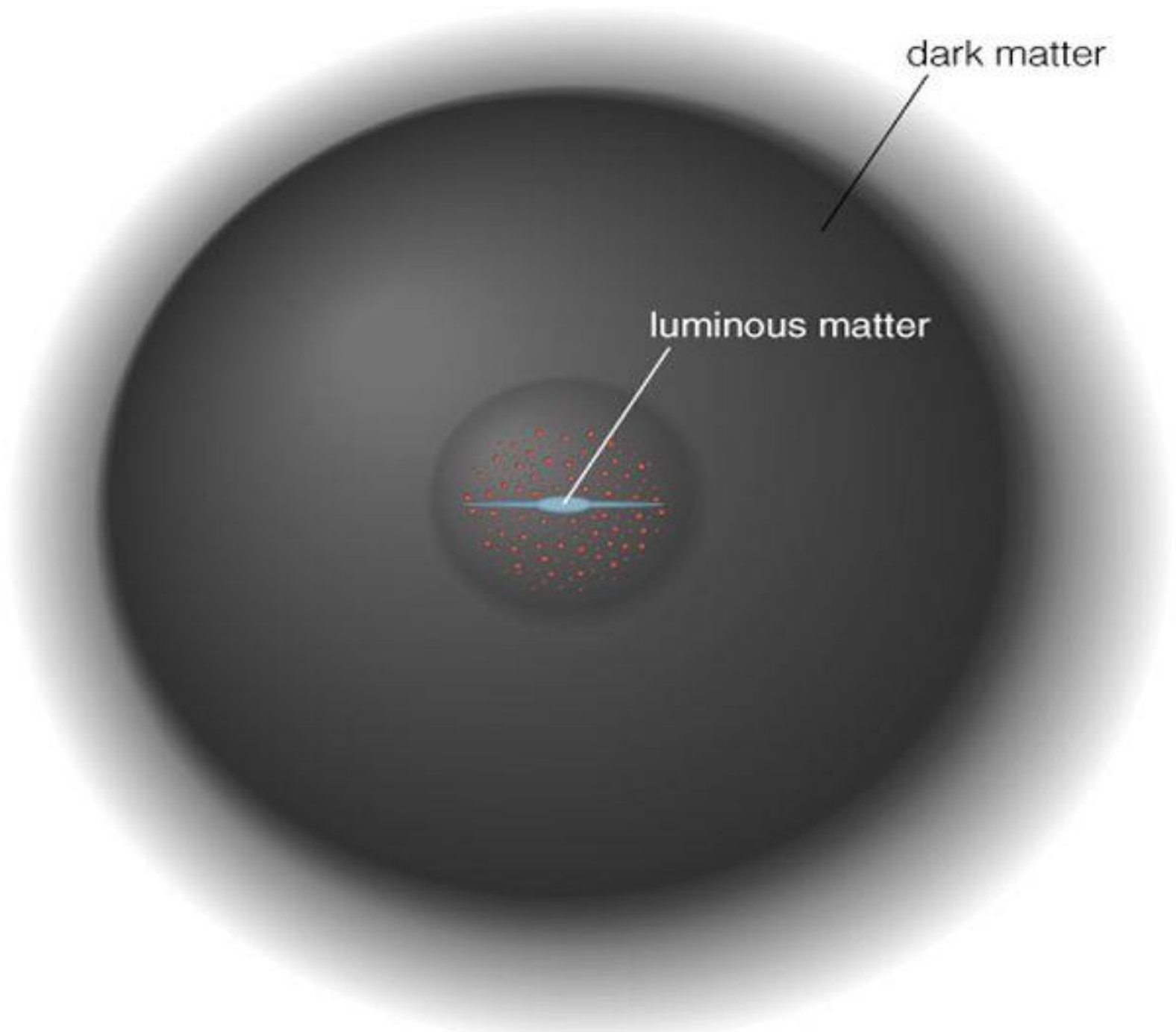
Irregular galaxies are smaller than elliptical and spiral galaxies. The shape of an irregular galaxy is uncommon. Usually have lots of gas and dust and young stars.

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dark matter

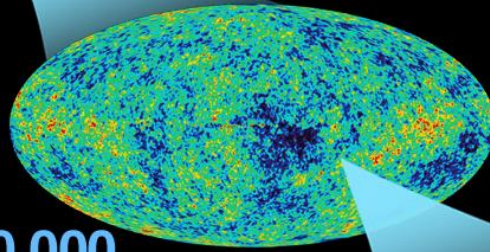
luminous matter

**DAWN
OF
TIME**



**tiny fraction
of a second**

inflation



**380,000
years**

**13.7
billion
years**



The MILKY WAY GALAXY

The Milky Way as you know is our galaxy and home that we live in. It is home to at least 200 billion stars and is considered a “giant” type of galaxy. Our galaxy is considered a Spiral Type of galaxy because of its spiral spinning shape and the big bulge in the middle. The center of our galaxies (which is called the Galactic Center), like most galaxies contain more stars than the outer parts. In the center is the main star Sagittarius A* which scientists are confident it is a super massive black hole and just recently found out that there are super massive black holes in the center of every galaxies.



Spiral Galaxies

- There are two different types of Spiral Galaxies.
- One is just Spiral Galaxy and the other is a Spiral Barred Galaxy.
- The two types are very similar to each other



• Spiral Barred Galaxy



• Spiral Galaxy

Properties of Spiral Galaxies

- Shaped like flattened disks with one or more spiral arms.



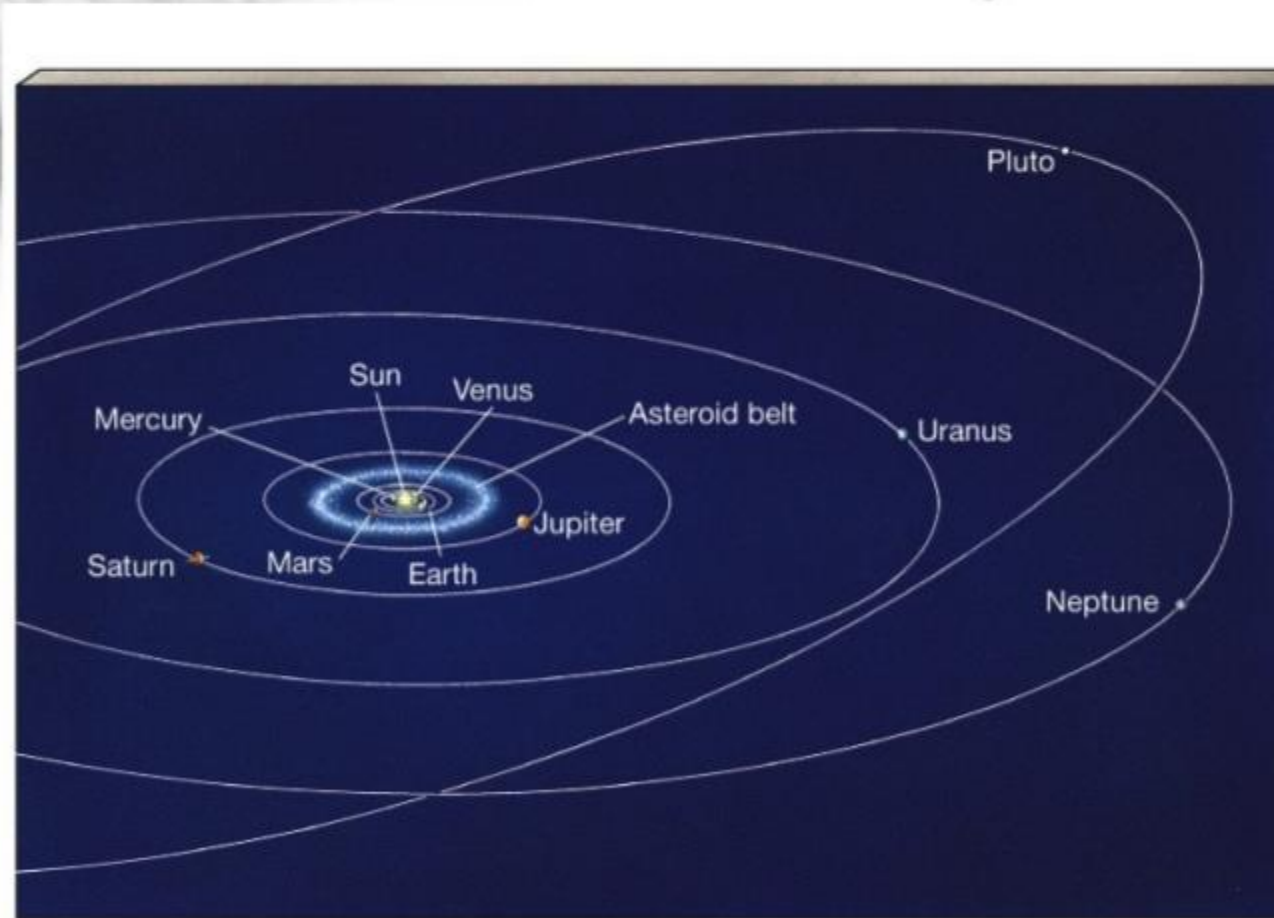
- Our galaxy, Milky Way, is a spiral galaxy.
- Our solar system is located in one of the spiral arms.

Masses - determined through observing the gravitational effect of the planet on some nearby object (moons, nearby planets, satellites)

Density - divide mass by volume

- Planets orbit the sun counter-clockwise as seen from the North Celestial Pole.

- All planets are in the same orbital plane EXCEPT Mercury and Pluto.



Terrestrial Planets

•Mercury, Venus, Earth and Mars

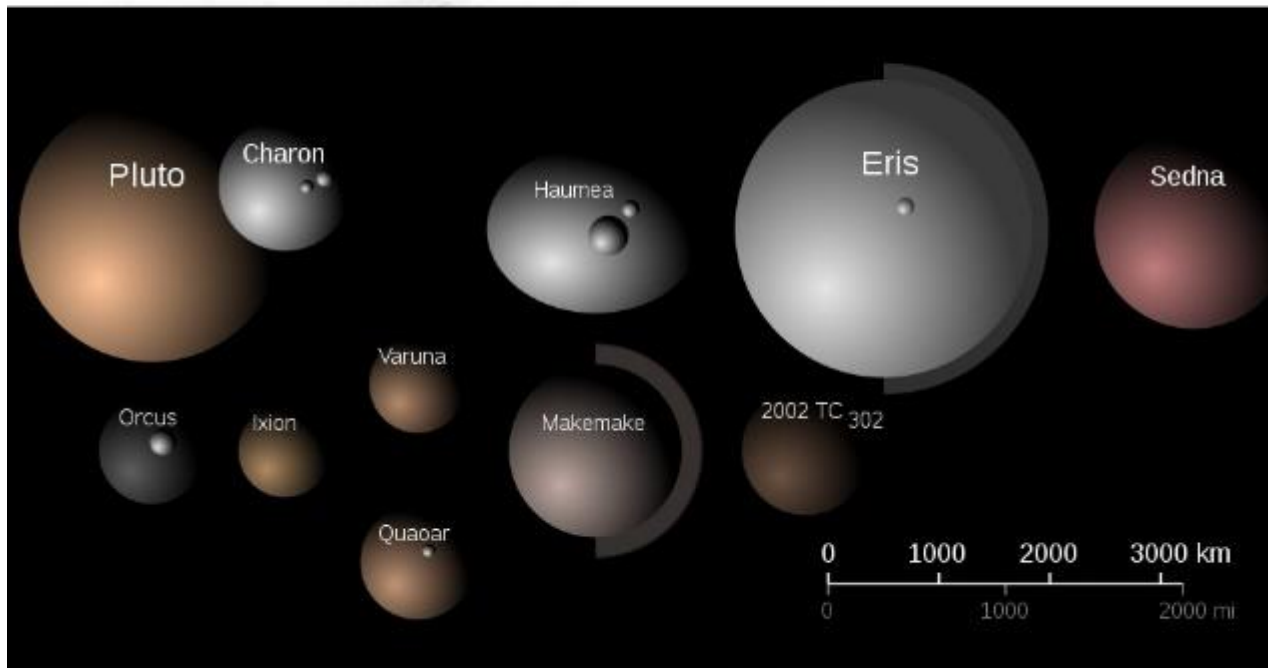
- Close to Sun
- Small masses, radii
- Rocky, solid surfaces
- High densities
- Slow rotation
- Weak magnetic field
- No rings
- Few moons

Jovian Planets

•Jupiter, Saturn, Uranus, and Neptune

- Far from Sun
- Large masses and radii
- Gaseous surface
- Low densities
- Fast rotation
- Strong magnetic field
- Many rings
- Many moons

OTHER SOLAR SYSTEM OBJECTS



Formation of the Solar System

Any theory to describe the formation of our Solar System must adhere to these facts:

1. Each planet is isolated in space
2. The orbits are nearly circular
3. The orbits of the planets all lie in roughly the same plane
4. The direction they orbit around the Sun is the same as the Sun's rotation on its axis
5. The direction most planets rotate on their axes is the same as that for the Sun
6. The direction of a planet's moon orbits is the same as that planet's direction of rotation
7. The Terrestrial planets are very different from the Jovian planets
8. Asteroids are different from both types of planets
9. Comets are icy fragments that don't orbit in the ecliptic plane

Condensation Theory for Planet Formation

The *gas* in the flattened nebula would never eventually clump together to form planets.

Interstellar dust (grain-size particles) lies between stars - remnants of old, dead stars.

These dust grains form *condensation nuclei* - other atoms attach to them to start the “collapsing” process to form the planets in the gas cloud.

