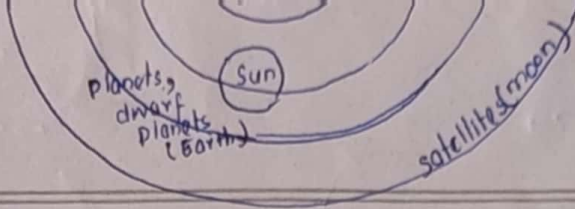


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Galaxy "How can you look at the galaxy and not feel insignificant" ~ Ridley Scott

A galaxy is a gravitationally bound system of stars, stellar remnants, interstellar gas, dust and dark matter.

- word galaxy → derived from Greek 'galaxias' meaning literally milky, a reference to the milky way.
- Astronomers → about 100-200 billion galaxies exist in the observable universe.

Example - Milky way and andromeda

Size → galaxies - range from dwarfs (with just a few thousand stars) to giants (with one hundred trillion stars) - orbiting their galaxies centre of mass

categories: - they are categorized according to

their visual morphology including → According to Hubble

1- spiral galaxies

2- elliptical galaxies

3- lenticular galaxies

4- and irregular galaxies - most recently

1 The spiral galaxies:

They are flat, rotating, spiral structure

Example: Milky way

Milky way: it is the large, disk shaped galaxy that includes our solar system.

- spiral galaxy shaped like a disk, usually with a bulge in the centre & arms that spiral outward, as the galaxy rotates

Block hole

Many galaxies thought to have black holes at their active centers which is a massive object (or region) in space that is so dense that within a certain radius

these types are as follows

its gravitational field does not let anything escape from it, not even light.

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→ In addition to the sun, milky way contains 200 - 400 billion other stars.

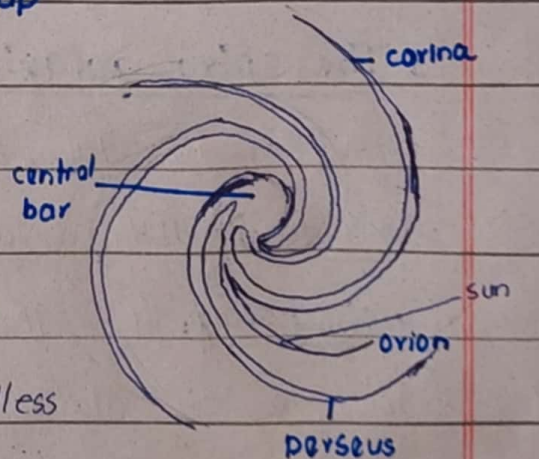
→ Most of the stars we see are in this galaxy.

→ It looks like a faint, band of white in the night sky. Main features of Milky way galaxy are the following:

- They are about **100,000** light years in diameter
- formed about **13.7** billion yrs ago
- Sun takes roughly **250** million yrs to orbit around it.
- ^{our} Solar system is **30,000** light yrs away from it's center
- Major arms of Milky way are
 - ↳ Perseus Arm
 - ↳ Sagittarius Arm
 - ↳ Centaurus Arm
 - ↳ Cygnus Arm
- Our solar system → in minor arm called **Orion spur / Orion Arm**
- **Galactic Plane:** The region in the space occupied by Milky way
- **Andromeda:** Nearest galaxy to milky way.
- Our milky way is the part of three dozens of galaxies called **Local group**.

2- Elliptical galaxies:

- They have an elliptical profile, give them an elliptical ellipsoidal appearance regardless of the angle.



Spiral galaxy: milky way

- this is the galaxy that has generally elliptical structure shape and that has no apparent internal

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structure or ρ spiral arms.

Example: Galaxy M49 & Galaxy M59

The Lenticular Galaxy:

The immediate form which has the properties of both elliptical and spiral galaxy

- It contains a large-scale disk but doesn't have large-scale spiral arms.

The irregular Galaxy:

An irregular galaxy is the catchall name given to any galaxy that does not neatly align fit into one of the categories of the Hubble classification scheme.

- structures do not align neatly
- can not be readily classified as spiral, elliptical & lenticular.

Example: The small Magellanic clouds and The large Magellanic clouds.

- These galaxies do not have big massive black hole like other three types — they have dispersed ^{small} black hole that just pull star enough that neither they disperse completely nor tightly bound like other galaxies.