Galaxy (आकाशगंगा)

A Galaxy is a system of stars, interstellar matter (gas & dust), dark matter, bound together by gravity. The space between Galaxies is filled with a tenuous (तनु, झीना) gas (intergalactic medium) with an average density of less than one Atom per cubic meter. Galaxies have Magnetic Fields of their own which drive mass inflow into the centres of Galaxies & affect the rotation of Gas in the galaxies. *

Types → Galaxies, averaging an estimated 100 million stars, range in size from Dwarfs (with less than a 100 million stars) to the largest Galaxies known Supergiants (with 100 trillion stars), each orbiting it's Galaxy's centre of mass.

* Most of the mass in a typical galaxy in the form of Dark Matter, with only a few per cent of that mass visible in the form of stars & Nebulae. Supermassive Black holes are a common feature at the centres of Galaxies.

→ Most Galaxies are gravitationally organised into →

Groups

A galaxy group is an aggregation of Galaxies comprising about 50 or fewer gravitationally bound members.

Clusters

Collection of Galaxies larger than Groups that are First-order clustering are called Galaxy clusters.

Superclusters

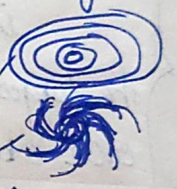
The groups & clusters of Galaxies can themselves be clustered into Superclusters of Galaxies.

The 'Milky way Galaxy' is a part of a Group of Galaxies called the LOCAL GROUP which it dominates along with the Andromeda Galaxy as well as others. This Local Group is part of the VIRGO SUPERCLUSTER. A 2014 study indicates that the Virgo supercluster is only a lobe of an even greater supercluster called LANIAKEA, a much larger & competing cosmic superstructure of the Universe.

(nearest large Galaxy to the Milky way)

Galaxies are categorized according to their visual morphology as →

- Elliptical, → 17% of the total galaxies
- Spiral, → 60% of the total galaxies
- Irregular, → 23% of the total galaxies.



Our Milky Way is a barred Spiral galaxy with a central bar-shaped structure composed of stars. Bars are found in about 2/3rd of all spiral galaxies.

→ **Constellation** (तारामंडल)

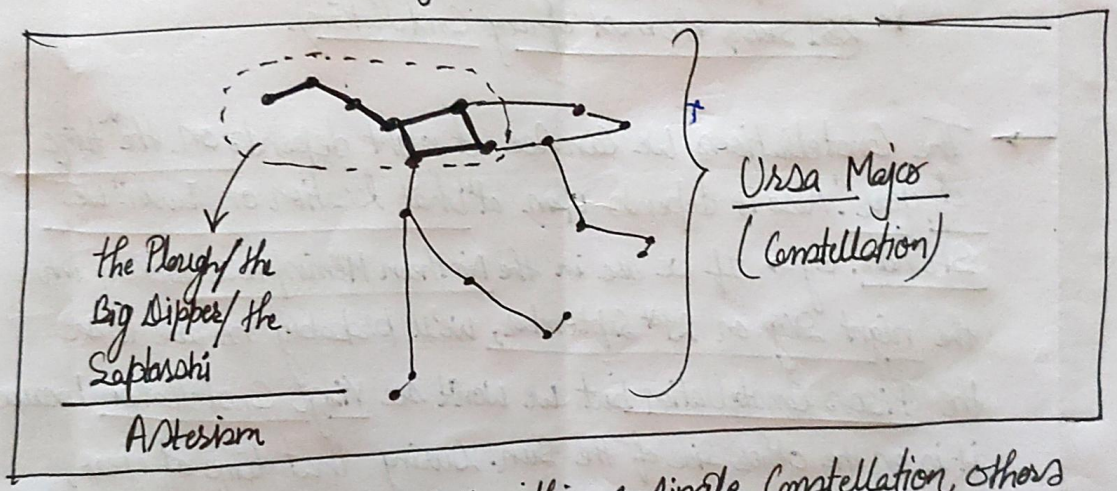
Constellation in astronomy, is any grouping of certain stars and configuration of Recognisable patterns (विशेष) Conspicuous Celestial Sphere in the sky. ~~Constellations are useful in assisting astronomers & navigators to locate certain stars.~~ In other words, Constellations are the two-dimensional pictures & shapes which connecting the stars in the sky to stories from cultures around the Globe.

~~Celestial Sphere~~ Relevance (12 zodiac signs)

In addition to their cultural significance, Constellations have also been important instruments that once marked the passage of time and the season. Using the Constellations as a reference point to spot faster-moving planets. It can also be used to describe where a meteor shower might appear in the sky, or where a comet might come into view. Even autonomous

spacecraft, sent to explore far from Earth, can use Constellations in their star maps to navigate. Constellations are also useful in assisting astronomers & navigators to locate the certain stars.

→ In addition to the Constellation line patterns, there are also ASTERISM line patterns (a smaller group which may be the part of the Constellations & not but not official) widely recognised. eg → the Seven bright stars in URSA MAJOR, known as "the Plough" in Europe, "the Big Dipper" in America & "Saptarshi" in India.



Some Asterisms fall within a single Constellation, others cross Constellations.

~~→ As Earth spins, the stars appear to move across our night sky from East to West, for the same reason that our Sun appears to "Rise" in the East & "Set" in the West. Stars~~

→ At the First General Assembly of IAU (International Astronomical Union) held in Rome in 1922, formally accepted the modern list of 88 Constellations (which includes all 12 of the Zodiac Constellations) covering the entire sky ~~at the end of IAU held in Cambridge England,~~ and in 1928 adopted official Constellation boundaries that together cover the entire celestial sphere. out of the 88 Modern Constellations,

(36) lie predominantly in the Northern sky & the other (52) predominantly in Southern sky. Some examples → Ursa Major (3rd largest), Ursa Minor (Pole Star @ Northern is a part of it), Orion, Hydra (largest Constellation due to the biggest Solid Angle (Atlas)) → (It is a measure of how large the object appears to an observer looking from that point)

Pole Star is aligned with the Axis of Rotation of the Earth's pole & Celestial poles

Virgo (2nd largest), Centaurus, Cygnus etc.

~~largest according to no. of stars, appx 150 (each +/- 25 stars).~~

281 stars, the most of any Constellations).

→ The Constellations we can see at night depends on the "time of year". Also it depends upon at "what location on Earth" we stands. eg→ If we are in the Northern Hemisphere looking into the night sky on 21st September, we'll probably be able to see the Pisces Constellation but we won't see Virgo Constellation because it is on the other side of the Sun. During that time of year, Virgo would only be visible during the day time, but we had never see them because of the Brightness of our Sun.

It should be realised that the group of stars that made up the original constellation patterns have, in most cases, No physical connection with Each other. They are simply our Earth-based interpretations of 2D star patterns on the Celestial Sphere.

(It is the imaginary sphere of infinite radius with the Earth at its centre. It is used for describing the positions & motions of stars & other objects.)