

Galaxies and Constellations

What are Galaxies?

Astronomers used to look at the nights sky and see many stars and fuzzy images of what they thought were nebulae

with the Hubble Space telescope we now recognize that space has BILLIONS Galaxies, each containing hundreds of billions of stars

What is a galaxy?

a collection of _____ of _____, _____, and _____ matter all held together by _____

galaxies range from _____ with as few as 10 million starts (10^7 stars) up to _____ with one trillion stars (10^{12}) stars, all orbiting a common centre of _____

The galaxy to which our Sun belongs is the _____ galaxy

Our Sun is one of _____ Billion stars in the Milky Way

Every star seen with the naked eye belongs in the Milky Way

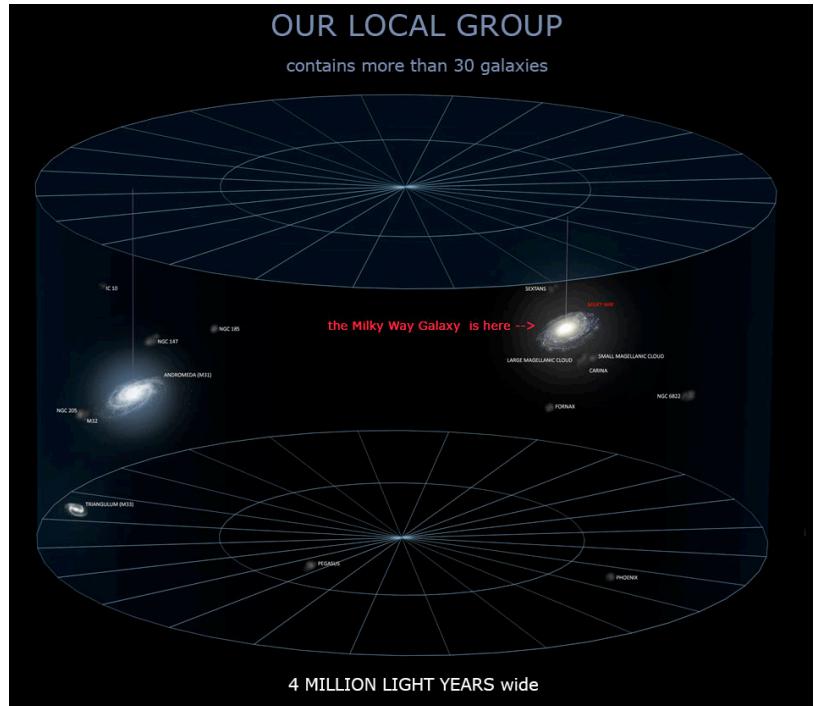
Milky Way is about _____ light years in diameter and _____ light years at its thickest point

The Milky Way belongs to a small cluster of 54 galaxies (including dwarf galaxies)

The nearest neighbours in the _____, the two _____, are in the Southern Hemisphere. These two galaxies can be seen without a telescope

Another neighbour, _____ Galaxy, is faintly visible to the unaided eye in the Northern Hemisphere

The Andromeda Galaxy is larger than the Milky Way and is about _____ light years away



galaxies also contain many multiple star systems, star clusters, and various interstellar clouds

Star clusters are groups of about one million stars held in their own mutual gravity shape

Types of Galaxies

There are 5 types:

- _____
- _____
- _____
- _____
- _____

Spiral Galaxies

Spiral galaxies consist of a flat, rotating disk of stars, gas and dust, and a central lens shape concentration of stars known as a _____

Spiral galaxies are names for there _____ (usually 2) that trail behind the galaxy as it rotates

The spiral arms are sites of _____ and are brighter the surrounding disk because of the young, hot stars that inhabit them

Ex. Andromeda



Bulge

A bulge is a huge, tightly packed group of stars within a larger formation

the term commonly refers to the _____ found in most spiral galaxies

Super massive _____ are thought to be at the center of many bulges

Barred Spiral Galaxy

type of spiral galaxy with an additional _____, extending from the central bulge, at the end of which the spiral arms begin



NGC 1300

Elliptical

Elliptical galaxies have _____

They range from nearly spherical to lens shaped. Have no arms and almost no gas and dust.

In the outer regions, many stars are grouped into globular clusters

_____ as a whole
made of older stars

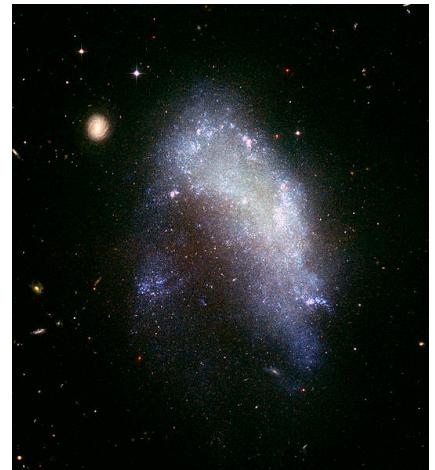
Irregular Galaxies

These galaxies are neither spiral nor elliptical stars are _____ spread

They are often chaotic in appearance, with neither a nuclear bulge or any trace of a spiral arm structure

Most irregular galaxies were once spiral or elliptical galaxies but were deformed by

Small Magellanic Cloud



NGC 1427 A

Lenticular Galaxy

type of galaxy between an elliptical galaxy and a spiral galaxy

also known as _____ galaxies

lost / used up most of _____ and therefore have very little star formation

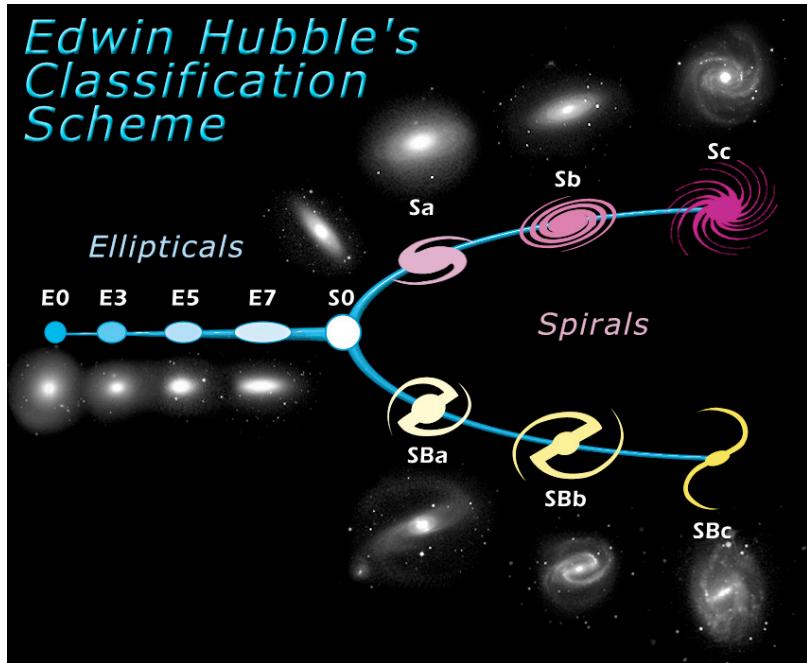
Starburst Galaxies

Is a galaxy in the process of an exceptionally high rate of _____

galaxies are often observed to have a burst of star formation after a _____ or _____ between two galaxies

The rate of star formation is so great for a galaxy undergoing a starburst that, if the rate was sustained, the gas reservoirs from which stars are formed would be used up on timescales much shorter than the dynamical lifetime of the galaxy.

Edwin Hubble's Classification Scheme



Constellations

Constellations are groups of stars that appear to form _____ in the sky

_____ woven into the mythology of ancient civilizations

the real purpose for the constellations is to help us tell which stars are which

_____ different constellations can be seen from the Northern and Southern hemispheres

have been used as _____ for millennia

Constellations

: never set below the horizon

In the north appear to rotate around the north star (_____)

How many you see depends on your _____

Ex. Ursa Major, Ursa Minor and Cassiopeia (northern)

the apparent movement of these circumpolar constellations is due to the _____

Earth rotates from WEST to EAST

therefore the stars, the moon, and the sun all _____ in the East and _____ in the WEST



Asterisms

Pattern of stars recognizable with the naked eye
but they _____ form constellations on
their own.

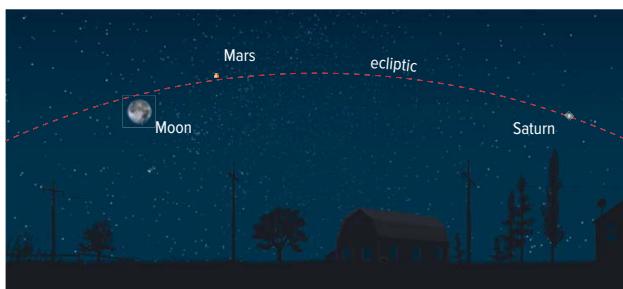


The _____

The path of the Sun across the celestial sphere is very close to that of the planets and the moon.

Caused by Earth's orbit around the Sun

Called the Ecliptic because of its relation to eclipses



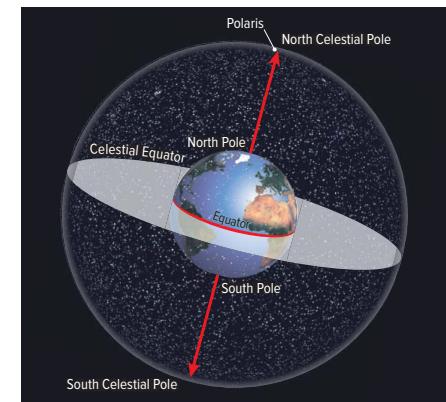
Celestial Sphere

Imaginary sphere centred on earth on which all celestial bodies can be projected.

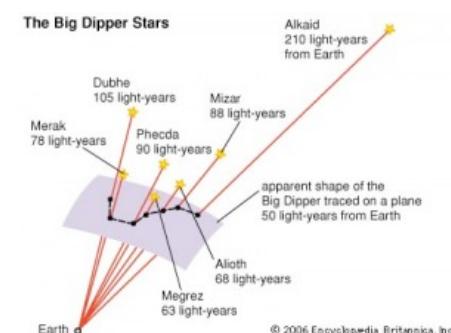
Used to describe the position of objects in the sky

Divided into a northern and southern

(Fig. 4.10)



The stars in Asterisms and Constellations have any relation to each other



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