Lect 8: Galaxies 19.3 Part 1

With help from:
http://www.cosmos4kids.com/files/star3.develop.htm l

1. Review from Last Time

2. A Star is Born

What is a galaxy?

So now that we've talked about stars, it is time to discuss how these stars are organized in the universe.

A galaxy is a huge group of stars, dust, gas, and other objects bound together by **gravity**.

Galaxies come in a variety of sizes and shapes.

What is a galaxy?

- The largest galaxies have trillions of stars, others have only a few million.
- Edwin Hubble, the astronomer for whom the Hubble Space telescope is named, began classifying galaxies in the 1920s.
- **Be sure to draw these in the space provided!**

Five types of Galaxies

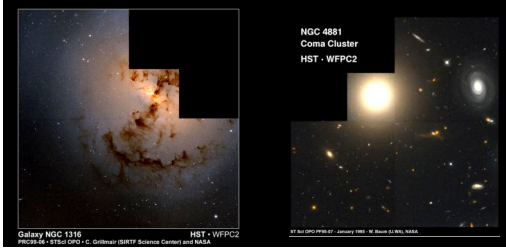
1. **Spiral** Galaxy:
   - Looks like a **pinwheel** – central dense area surrounded by spiraling arms
   - Most common type
   - Central region is yellow: made up of cooler stars
   - Outer arms are blue: made up of new stars

Five types of Galaxies

2. **Barred** –Spiral Galaxy:
   - A spiral galaxy with a **bar-shaped** structure in the middle
   - Sometimes have just **1 or 2** spirals, or "arms"

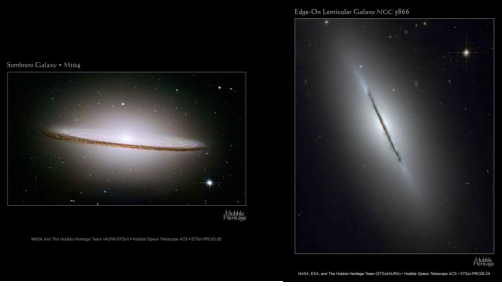
Five types of Galaxies

3. Elliptical Galaxy:
   - Looks like the middle part of a spiral galaxy, but without the arms.
   - Some astronomers think these are actually spiral galaxies, but we're looking at them sideways & can't see the arms.



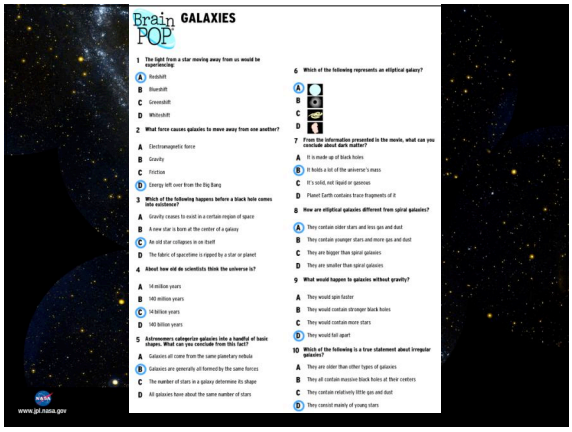
Five types of Galaxies

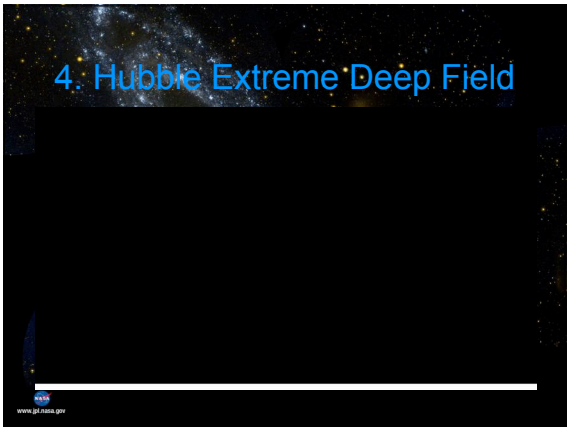
4. **Lenticular** Galaxy:
   - **Lens-shaped** with a smooth, even distribution of stars
   - No central dense region



Five types of Galaxies

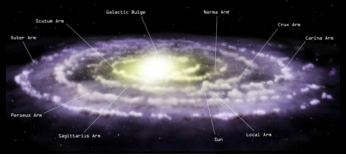
5. **Irregular** Galaxy:
   - Don't fit into any other classification
   - Do not appear to rotate
- BrainPOP: Galaxies

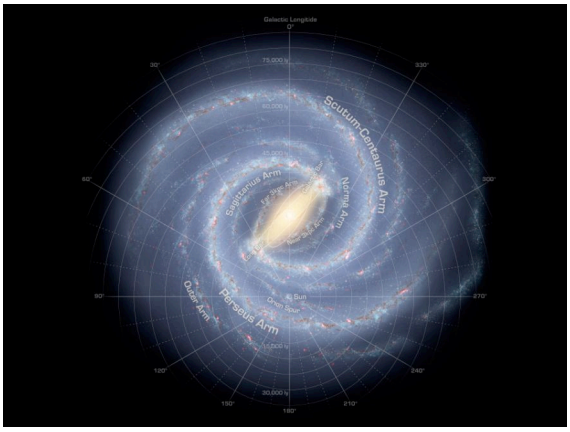


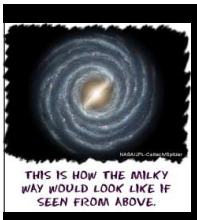


Our Galaxy: The Milky Way

- barred-spiral galaxy
- about 12-14 billion years old
- It is 100,000 light years across
- the bar in the center extends about one-third the diameter of the galaxy
- Our sun sits about 26,000 light years from the center of the disk - on one of the spiral arms
- Astronomer's think there is a giant black hole at the center

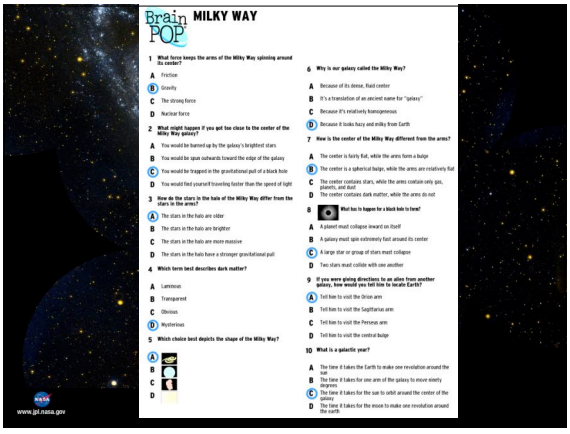






- When you look up at the sky, you can see the milky way band going across.
- We are looking in from the edge
- BrainPOP: Milky Way

Milky Way Galaxy



Do we have neighbors?

- Our closest neighbor is Proxima Centauri, a star.
- It is about **4.2** light years from Earth.
- Even though it is close, it is a tiny **red dwarf** with a luminosity of 0.006 - so it's hard to see.
- At this time, the Voyager spacecraft are the only manmade objects to leave the Solar System.
- Launched in 1977, they should reach the edge of the Solar System by 2015.
- At this pace, they will need to travel another 82 thousand years before reaching the closest star.

Do we have neighbors?

- The closest galaxy is called the Sagittarius Dwarf.
- It is a little over 78,000 light years away.
- If it would take us thousands of years to reach the closest star, you can only imagine how long it would take to reach the closest galaxy.

Do we have neighbors?

- The milky way belongs to a group of about 30 galaxies called the local group.
- This group include the Large Magellanic Cloud & the Small Magellanic Cloud.
- It also includes the Andromeda Galaxy, which is 2.9 million light years away.

This pair of galaxies, NGC 4676, also known as "The Mice" for their tails of stars and gas, have collided and will eventually merge into a single galaxy.

Streams of material have been tugged out of the galaxies by the force of gravity, triggering new starbirth.