


Discover: Galaxies

Use the 'Galaxies' App to navigate through and answer the following questions. Be sure to watch all videos and read all sections. Be sure to click on any  icons, they often contain additional information!

Section 1: Star Studded Galaxies

What Galaxy do we live in? Where in this galaxy do we live?

Milky Way, in the 'suburbs'

What is a galaxy? **A huge swarm of stars**

What is the nearest star to our Sun, and how far away is it? **Proxima Centauri**

Edwin Hubble recognized that there were other galaxies other than our own, and that these galaxies were moving away from each other.

The most distant object the human eye can see is the

Andromeda. We're seeing this galaxy as it was **2.2 million** years ago.

Section 2: The Milky Way Merry Go Round

The Milky Way is constantly spinning. One complete circle of the Milky Way takes **225 million** years.

Because of our current position, as well as stars and gas clouds that block our view, it is impossible for us to definitively tell what our galaxy looks like.

Describe the shape of the Milky Way:

Barred spiral

What celestial body can be seen in the southern hemisphere?

Megellanic Clouds

A nebula is:

a giant irregular cloud of gas

Johannes Kepler was the first to recognize that the orbits of the planets were ellipses, not circles.

Our Earth, Sun, and our entire solar system is located near a small partial arm called the **Orion Arm**

Section 3: Exotic Galaxies

Stars, and therefore the majority of galaxies, emit mostly visible light. However, some galaxies show very powerful emissions in the form of **radiation**.

Quasars are celestial bodies that emit large amounts of radio waves. One quasar emits the light of about **one hundred galaxies** combined.

A black hole is: **an object whose gravitational pull is so strong, not only light can escape it.**

Section 4: Through the Looking Glass

One of the largest obstacles to making observations in distant galaxies is air. Why is this?

Particle in the air scatter starlight.

Why are many telescopes located on mountaintops? **The air is thinner up there**

The Hubble Telescope has discovered phenomena like the hottest star observed, evidence of a black hole, the wreckage of a galaxy collision, and a super storm on Saturn's surface.

The Hubble Space telescope went into orbit in **1990**.

Since then, we use a variety of telescopes to see different types of objects.

- **X-ray** and **Gamma-ray** telescopes study the hottest most explosive objects in space.

- **Infrared** telescopes study the areas

where stars are born.

- **Ultra Violet telescopes** study very hot stars.

Maria Mitchell discovered the first comet not visible to the naked eye.

SETI stands for **Search for Extra Terrestrial Intelligence**. They use giant radio telescopes to help listen for alien messages.

How many stars can you see in an urban area? **300** With a telescope? **2 million**

Section 5: A Galaxy is Born

Fill in the following table outlining how galaxies are born:

Step 1	Smooth distribution of matter, gravity of massive star clumps attract more matter
Step 2	1-2 billion years later, clumps grow larger. 2-4 billion years, collisions cause irregular shapes.
Step 3	4-13 billion years galaxies take the shapes we see today.

How do galaxies get their shapes?

Elliptical galaxies are a result of: stars mix together from all directions, gas turned to stars early

Spiral galaxies are a result of: gas form starts rotating

The galaxy that got it's shape as a result of a head-on collision is the **Cartwheel Galaxy**.

In 2012, astronomers discovered the most massive galaxy cluster ever seen and nicknamed it "El Gordo"

Section 7: Clusters of Galaxies


Most galaxies are isolated. However, some galaxies gather together in clusters. At the centre is often a giant elliptical galaxy called a **central dominnt**. These galaxies seem to grow bigger by **swallowing** other galaxies.

We live in a small cluster of galaxies called the **Local Group**.

Spiral	Thin pinwheel with long curved arms and a bulging center that contains old stars
Barred	Spiral arms that spin out from a central bar
Irregular	No distinct shape
Dwarf	3 to 10 times smaller then other galaxies
Elliptical	Oval with lots of old stars

Use the following table to describe galaxy shapes

Sky View Scavenger Hunt

Use the app SkyView to locate the following celestial bodies. You will need to be locked onto the celestial body to read information about it. Once they are located read the information under the  icon. Tap the icon to read additional information and find the answer to the clue.

Ursa Major can be seen during _____.

Libra has _____ first magnitude stars.

Saturn: A day on Saturn is about _____.

Mars: A day on Mars is about _____.

The **International Space Station** will be at it's highest point at _____.

The **Hubble Space Telescope** will be at it's highest point at _____.

The star **Polaris** is in the constellation _____.

One **Moon** day is about _____ Earth days.

One **Jupiter** day is about _____.

One day on **Mercury** is about _____ Earth days.