

The Universe

A night landscape featuring a river with many rocks, a forested hillside, and a clear view of the Milky Way galaxy in the dark sky. The Milky Way is the central focus, appearing as a dense band of stars and dust stretching across the sky. The foreground shows a river with numerous smooth, dark rocks. The background consists of a dark, forested hillside under a starry sky.

Chapter 25.3

The Big Bang Theory

At one time, the universe was one dense, hot, and supermassive ball.

Then, around 13.7 billion years ago, a violent explosion occurred, and hurled the material in all directions

Don't trust an atom....they make up everything!

Eventually the universe cooled down enough for atoms to form.

~ 200 million years later:

Gases condensed and began to form the stars and galaxies we now observe.



Types of Galaxies

- spiral: bright center of stars with arms spiraling out
- Milky Way was believed to be a spiral



- barred spiral: have a group of stars making a bar through the center



- elliptical: shape ranges from spherical to oblong
 - no arms
 - 60% of all galaxies are elliptical



- irregular: small, faint stars spread out unevenly with no pattern



The Milky Way Galaxy= Barred Spiral

- There may be more than 100 billion stars in the Milky Way!
- It is about 100,000 light years wide and about 10,000 light-years thick at the nucleus!
- It has at least three distinct spiral arms.
- Our solar system is about 30,000 light years from the center!
- Our solar system orbits the nucleus about every 200 million years!

Milky Way facts

Old Data= Milky Way was a 4 armed "spiral"

New Data= the Milky Way is a 2 armed
"barred spiral"

Perseus & Scutum-Centaurus are wrapped around a bar of stars.

The Sun is located between the Sagittarius and Perseus arms, near the partial arm called the Orion Arm or Orion Spur.

Milky Way = Barred Spiral

