

Astronomy for Kids

The Universe

What is the universe?

The universe contains everything that exists including the Earth, planets, stars, space, and galaxies. This includes all matter, energy, and even time.

How big is the universe?

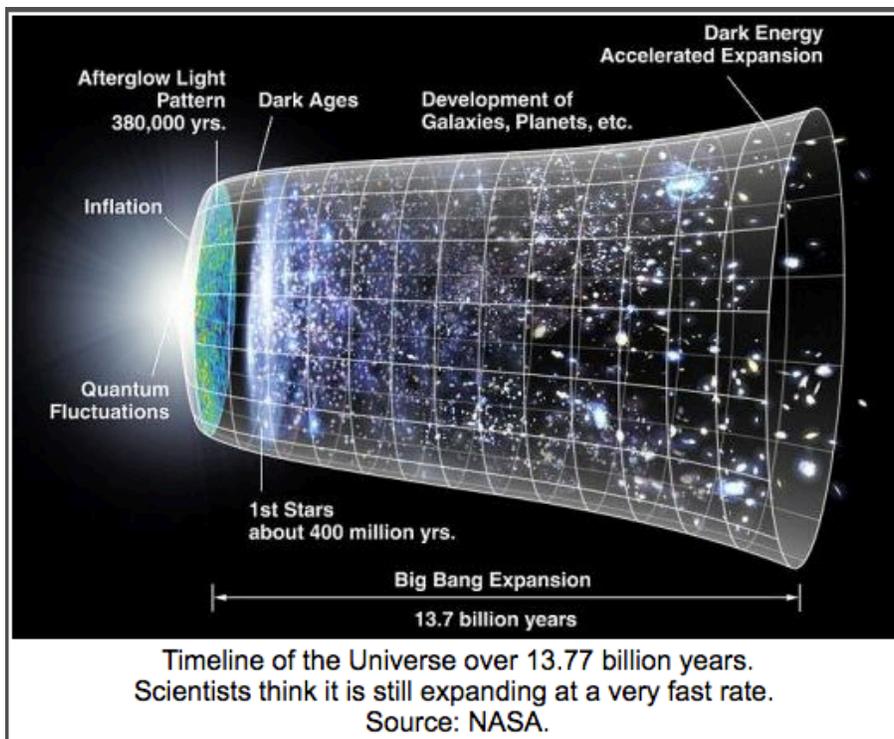
No one knows for sure just how big the universe is. It could be infinitely large. Scientists, however, measure the size of the universe by what they can see. They call this the "observable universe." The observable universe is around 93 billion light years across.

The Universe is Expanding

One of the interesting things about the universe is that it is currently expanding. It's growing larger and larger all the time. Not only is it growing larger, but the edge of the universe is expanding at a faster and faster rate. Scientists think that the edge of the universe is expanding faster than the speed of light.



The "Pillars of Creation"
Photo by the Hubble Space Telescope.
Source: NASA.



What is the universe made of?

Even though the Earth seems really big to us, it's actually a very tiny part of the universe. The Sun has a mass of 330,000 times the Earth. The Sun is just one star in the Milky Way galaxy that contains over 300 billion stars and scientists estimate that there are over 170 billion galaxies in the universe!

However, most of the universe is what we think of as empty space. All the stars together only make up around half a percent of the universe. The majority of the universe consists of something scientists call dark matter and dark energy.

What are dark matter and dark energy?

We mentioned above that the majority of the universe is made up of dark matter and dark energy, but what exactly are these things?

- Dark matter - Scientists aren't sure exactly what dark matter is, but they believe that it exists due to experiments. Dark matter gets its name because it cannot be seen with any type of instrument that we have today. Around 27% of the universe is made up of dark matter.
- Dark energy - Dark energy is something that scientists believe fills all space. It turns out that "empty space" is more than just nothing, but is really dark energy. The theory of dark energy helps scientists to explain why the universe is expanding. Around 68% of the universe is dark energy.

How old is the universe?

Scientists think that the universe began between 13 and 14 billion years ago with the start of a massive explosion called the Big Bang.

Interesting Facts about the Universe

- Distant galaxies are constantly moving further and further away from us as the universe expands.
- Every galaxy in the universe is moving away from every other galaxy. There is no center to the universe.
- Albert Einstein said that the shape of the universe was open, closed, or flat. Many scientists today think that the universe is flat.
- The universe appears to be cooling and may eventually freeze.
- Large empty spaces in the universe are called voids.
- The most abundant element in the universe is hydrogen. The second most abundant element is helium.

