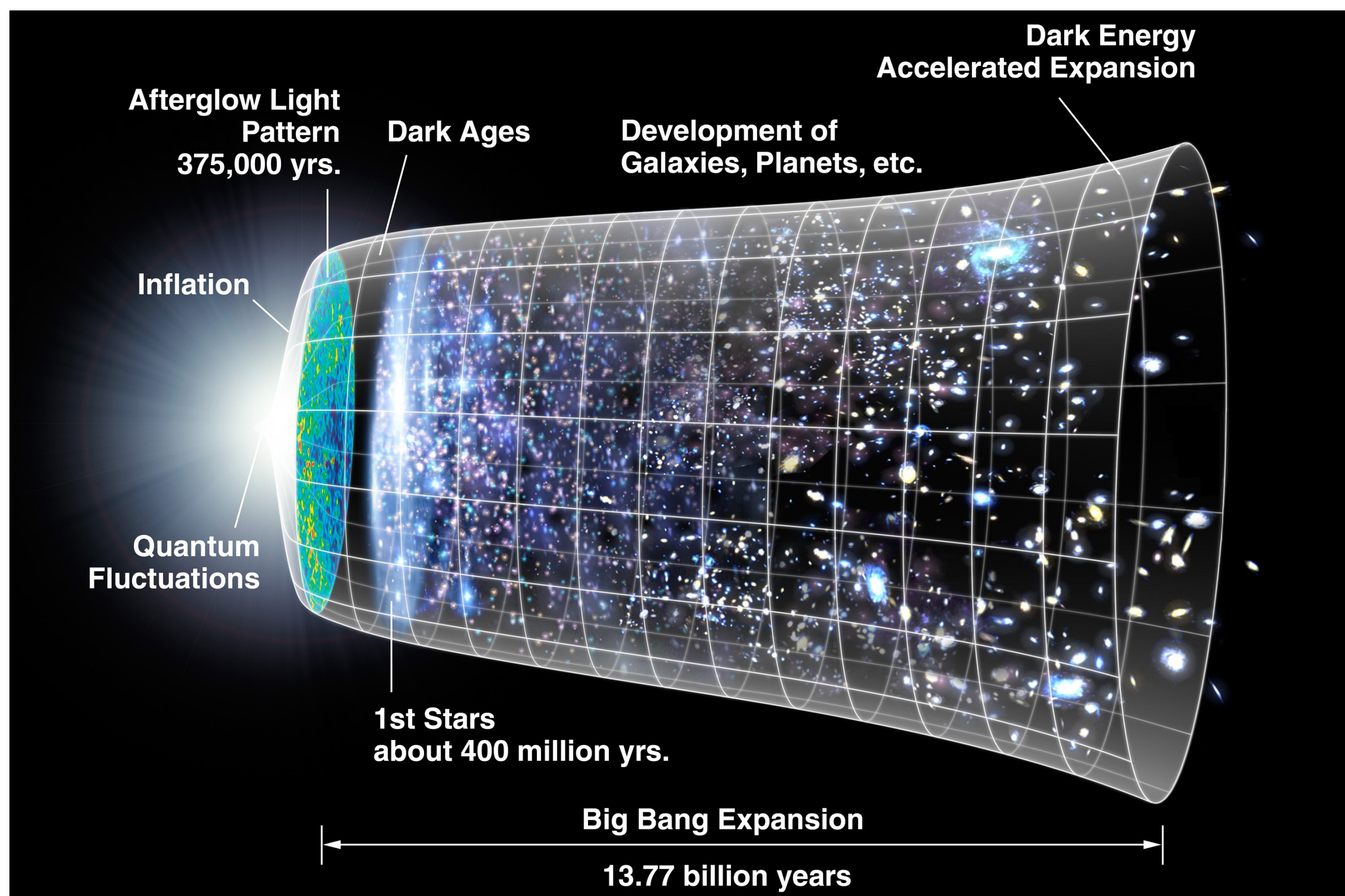


THE HISTORY OF THE UNIVERSE – FROM THE BIG BANG ONWARDS



13.8 billion years ago

From an incredibly hot, dense point, space appeared.

A hundredth of a billionth of a trillionth of a second later

The universe suddenly expanded hugely, doubling in size at least ninety times in a process called cosmic inflation. As the universe expanded it became cooler and less dense.

Within the first three minutes after the Big Bang

The first matter, the gases Hydrogen, then Helium, formed.

Until approximately 380,000 years after the Big Bang

Although atoms were forming, the universe was too hot and chaotic for light to escape. Light just bounced around among the atoms.

Approximately 380,000 years after the Big Bang

The universe had cooled enough for stable atoms to form. During this **recombination stage**, free electrons were absorbed, and the universe became transparent.

Cosmic dark age

This followed recombination. During this time, Hydrogen clouds slowly collapsed to begin forming the first stars and galaxies. Light only started radiating when this stage ended.

Approximately 400 million years after the Big Bang

The first stars and galaxies had formed. During the following 500 million or so years, more and more of these structures formed. This is called the **re-ionisation stage** because the ultraviolet light released by star formation destroyed most of the surrounding Hydrogen.

From approximately 1 billion years onwards

More stars and galaxies formed, died or were destroyed, and others formed in their place. The universe appeared then very much the same as it does now.

Approximately 9 billion years after the Big Bang

The Milky Way galaxy started forming. Around 400 million years later, our solar system started emerging from a giant rotating cloud of gas. As gravity made it spin ever faster, the material flattened into a disc, with most of the matter being pulled towards the centre, forming the Sun. The planets formed from the remaining outer material (see the Solar System tablet).

Cosmic expansion

During the first eight billion or so years after the explosive expansion of cosmic inflation, the universe continued to expand. Matter dominated, with the inward-pulling force of the gravity of Baryonic matter and Dark matter (see the Cosmic Pie tablet) slowing expansion. After this time, the rate of expansion started to accelerate as gravitational forces became weaker than the outward-pushing force of Dark energy.