

The Big Bang Transcript

Have you ever wondered how it all began? Life, the Earth, the cosmos?

The answer lies in the stars... because the farther out into space we look, the further back in time we see.

By observing our universe, we have witnessed the unfolding of its 13.7-billion-year history. A history that began with the Big Bang.

Using millions of astronomical observations, scientists are mapping the cosmos. We're flying through an accurate 3-D map right now. This isn't just a movie; it's a virtual universe.

But the universe is never static. And the motions of all the objects in space tell us about its nature and evolution.

Galaxies spinning faster than expected betray the presence of “dark matter.” Measurements show that this invisible stuff far outweighs the ordinary matter we see with our eyes and telescopes.

Galaxies speeding away from each other reveal that space has been expanding since the beginning of time.

And finally, beyond the most distant galaxies visible from Earth is the Cosmic Microwave Background, the oldest light we’ve detected. Slight variations in this ancient light reveal the seeds of everything in our universe.

How were these seeds planted? To find out, we need to travel beyond this cosmic horizon to the very beginning of time and space, when the universe began with the Big Bang!

Immediately after the Big Bang, the visible universe was smaller than an atom. But in just an instant, it inflated to an astronomical size.

This very young universe was a soup of energetic particles, hotter and denser than the center of our Sun. Under these extreme conditions, light was trapped with matter, and the entire universe glowed.

But as space continued to expand and cool, light slipped free and the universe became transparent. This is the moment imprinted in the Cosmic Microwave Background, the afterglow of the Big Bang.

Left behind by the light, both ordinary and dark matter responded to gravity. Over millions of years, larger and more complex structures emerged, from simple gas clouds to galaxies with stars and planets.

But new observations continue to raise new questions. Measurements of distant galaxies show that about 5 billion years ago the expansion of space began to accelerate. This suggests the existence of some force counter to gravity. The nature of this so-called “dark energy” remains a

mystery though its influence dominates the modern universe.

Our universe is a dynamic place that inspires wonder and exploration. Its history is written in light traveling to Earth across vast cosmic distances. You can explore that history by walking the Cosmic Pathway outside this theater. Every step will carry you almost 100 million years forward in time, from the Big Bang to the emergence of the Milky Way, past the formation of our Solar System, and on to the present day.