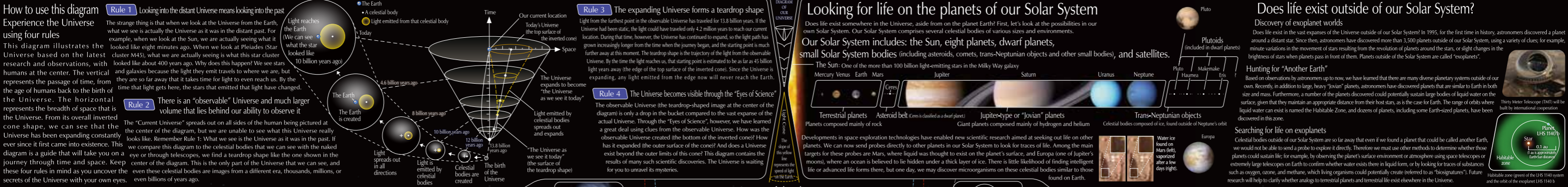
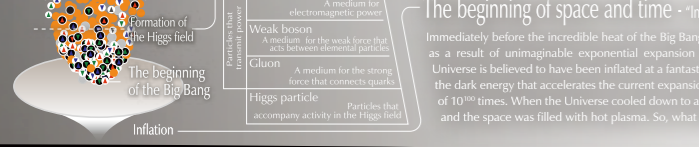
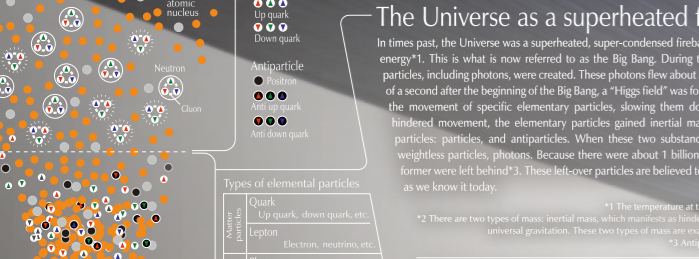
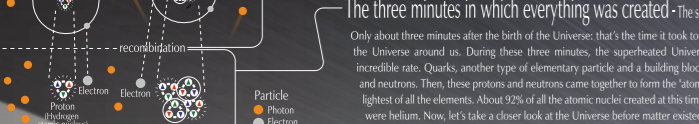
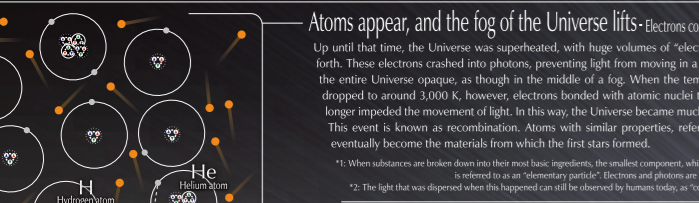
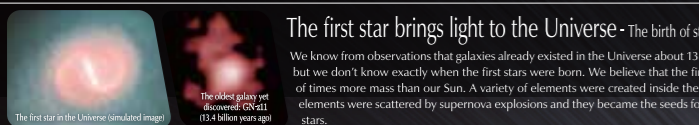
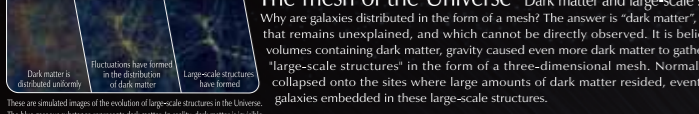
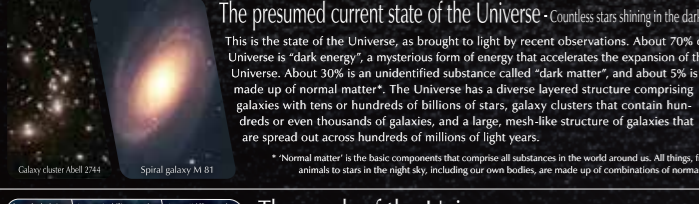


The Universe is the breadth of time and space that includes all physical entities. Humans, the landscapes that we see, the plants and animals that live here, all of this is part of the Universe. The stars and the sky, the Milky Way, which spreads its pale light among the stars, and galaxies so far away that they are only seen with a huge telescope - all these things are part of the Universe as well. The Universe encompasses all the things that we know, and everything beyond.

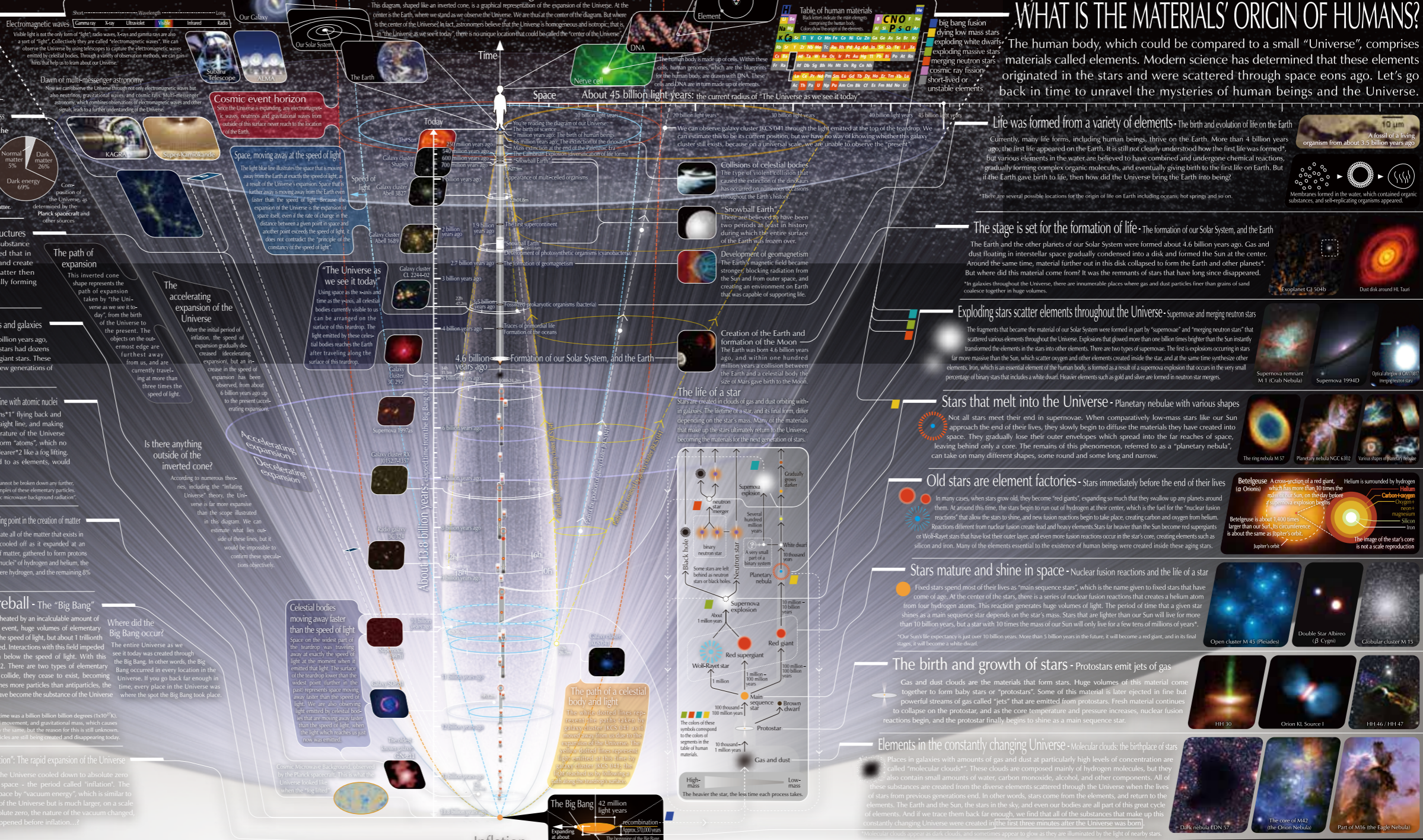


HOW DID OUR UNIVERSE COME INTO EXISTENCE?

This vast Universe we can observe was once so small that it could not be seen. Modern science is closing in on the secrets of the Universe, and is gradually gaining an understanding of the astounding origin behind the formation of the Universe itself. Let's look back at the history of the Universe, starting from the moment of its formation.



Is the Universe the only one?
Uncountable universes that theoretically exist. Some theories say our Universe was born from another universe. Many universes are born from an eternally inflating universe and our Universe is only one of them. This view of the world is one of the concepts called a "Multiverse". Superstring theory, that explains everything from particles to the Universe, supports this view. Based on the theory, our Universe has not only four dimensions (three dimensions for space and one dimension for time) but also another six dimensions which we cannot detect. The theory also predicts that over 10^{100} universes that have different sets of physical parameters could exist.



Can we see anything beyond the Universe?
Stars are shining in the night sky. The term "light-year" (the speed of light times the travel time of the light) is a unit of length intended to describe distance to those shining stars. We can draw a 3D star map based on the light-year distances, like the figure to the right. However, this figure has a fatal inconsistency if you extend the map to very large distances. The farther away celestial bodies are located, the older the images we see are. In other words, when we observe the very distant Universe, we observe the early age of our Universe and it should be smaller than the current Universe. However, the early days of our Universe become larger in a map drawn with the light-year distances. What is wrong? The problem is the light-year distance as a unit of length. It does not matter if our Universe is not expanding. But in our expanding Universe, while light is traveling from one part to another, the separation of the two points keeps expanding. Therefore the resulting "distance" could be something different from the type of "distance" we used to in our daily life. In this diagram of our Universe, we avoid this problem by plotting observable celestial bodies on a graph that has two independent axes, time and distance. How can we create a reasonable figure of our Universe based on our limited observable Universe is an important issue in science. Scientists wrestled with the issue, and changed the paradigm of the world as a result. Today, scientists consider the world that we cannot observe in addition to what we can observe. The new scientific concept of the Multiverse is one of the answers that scientists have proposed. Investigating the nature of the Multiverse, we may discover a new world based on currently-unknown theories.