

The researchers first recreated the first molecules in the universe, reproducing the conditions that existed immediately after the Big Bang. The results of the experiment change the understanding of how the first stars were formed, and forced to reconsider chemical processes involving helium in the early Universe, and scientists announced.

A few seconds after the large explosion, the temperature decreased, which allowed the first elements to form – hydrogen and helium. After hundreds of thousands of years, the atoms began to connect with electrons, forming the first molecules. One of these molecules was Helium-Hydride ion (HeH^+), which then contributed to the appearance of molecular hydrogen – the most common molecule in the universe.

These molecules played a key role in the formation of the first stars. To begin with thermonuclear synthesis, atoms and molecules must collide and release heat. Helium-Hydride ions are especially effective at low temperatures, which could accelerate the formation of stars in the early universe.

In a new study, scientists cooled ions up to -267°C and pushed them with heavy hydrogen, studying how the reaction rate depends on the temperature. It turned out that the reactions are not slowed down at low temperatures, which contradicts the previous theories.