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On the Evolution of the Baby Universe Before the Big Bang

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Abstract

The universe is known to have been born from the Big Bang. The Big Bang event, however, fails to explain why the total amount of energy and matter in the universe currently obeys the law of conservation of energy. Planck units, developed by Max Planck, have no known use, but can be used to specify the generation of energy or matter before the Big Bang. This matter is called pep. Pep was born from "없다"(Eobsda: Not to be). When spacetime containing Planck units is born, they become entangled and acquire mass, which is called Planck mass. Pep with Planck mass is peppized, allowing them to be individually counted. Baby universe grows as multiple peps accumulate. Baby universe does not obey the law of conservation of energy. As the baby universe's mass increases, its temperature rises, reaching the Planck temperature. When the mass of the baby universe reaches the Planck temperature, it eventually undergoes a Big Bang, forming the primordial universe. The baby universe's mass at that time is equal to the total amount of energy and matter in the present-day universe. When the baby universe annihilates with the Big Bang, no more pep is generated. Therefore, when the primordial universe is created with the Big Bang, the law of conservation of energy holds true.

Generation of a Pep

Physics is the study and elucidation of the universe, composed of matter and energy within space-time. "없다(Eobsda: Not to be)" the absence of space-time, matter, and energy, is philosophical concept that transcends physics. "없다" literally means nothingness. The concept of vacuum, as used in physics, is not included in "없다." Vacuum refers to a space devoid of matter and energy. Therefore, "없다" implies the absence of time, space, and energy, including matter. Separately, there is the concept of information. Information includes universal constants and "observation." Information seems to be an independent event from "없다." If information is included in "없다," then information was born first from "없다." Because information was born first, we can observe and explain the subsequent birth and evolution of the universe. The current universe originated from "없다." In a place where neither time nor space existed, a substance called pep(named for pre-energy particle), entangled with time and space, appeared. Pep is a substance generated by spacetime. As time and space are simultaneously generated, a substance called pep with mass is born within it. Pep is a substance in which spacetime has been peppized (peppization is named after quantization). Each pep is surrounded by spacetime, so each pep can be counted.

Peppization means that both time and space are peppized, so they can be counted individually. Pep is a substance with mass, trapped and entangled with time and space, and thus can remain in place without time passing. While we don't know how long a pep remains, at some point, spacetime creates a substance with energy called pep. However, when both spacetime and energy annihilated simultaneously, it reverts to "없다." This is called pep fluctuation. Since a pep can be generated and annihilated, the law of conservation of energy does not apply. It is unknown whether a pep is transparent or opaque. This is because spacetime is confined within a pep, so no information leaks out of a pep. Since pep is a spacetime-peppized entity, space does not expand, nor does time flow. When a pep is born, it is governed by four universal constants. Without these four fundamental informations, a pep would not have been born, or if a random pep had been born, the universe would have been different from the current one.

The Evolution of a Baby Universe

The four universal constants are the speed of light c, the universal gravitational constant G, the reduced Planck constant or Dirac constant $\hbar$, and the Boltzmann constant k_B. In 1899, Max Planck combined these to create Planck units. However, their use was unknown because they consisted of either extremely small or extremely large numbers.

Planck units are used to describe a pep of the baby universe. Planck length and Planck time are the basic units that make up a pep. Mass of a pep is also a unit that defines the energy generated by the Planck time and Planck length.

These are structured as follows:

Planck length = speed of light × Planck time,
Universal gravitational constant × Planck mass = Planck length × (speed of light)^2,
= Planck time × (speed of light)^3,
Boltzmann constant × Planck Temperature = Planck mass × (speed of light)^2.

Because length and time are specified by Plank length and Planck time, we can see that spacetime is peppized.

Pep is a substance unobserved in the present-day universe, but because it possesses mass, it exerts gravity.

It's unclear what triggers the growth of peps, but as the peppized spacetime begins to accumulate, spacetime expands. This is called a baby universe.

One pep is like a sugar cube. Over time, instead of placing another sugar cube next to it, it grows in the same proportions: length × width × height. In other words, it grows proportionally to l_p^3. If the baby universe continues to grow, its weight increases. At some point, the baby universe stops growing and experiences a moment called the Big Bang. This occurs after ~ Planck time $\times 10^{20}$. The weight of a fully grown baby universe converted into temperature; it reaches the Planck temperature. This heated baby universe eventually undergoes a Big Bang, becoming the primordial universe. At the time of the Big Bang, the baby universe's weight was equal to the sum of all energy and matter in the universe. The primordial universe expanded at the speed of light and was no longer governed by Planck units.

The primordial universe, born immediately after the Big Bang, follows Planck's law of black-body radiation.

Planck's law is stated as follows:

$$U_\nu(\nu, T) = \frac{8\pi h\nu^3}{c^3}\frac{1}{e^{\frac{h\nu}{K_B T}-1}}$$

Integrating this with respect to frequency v yields the following equation:

$$R = \frac{E}{V} = \omega T^4$$

where R represents the repulsive force, E represents the total energy of the universe, V represents the volume of the universe at the time of measurement, ω represents Planck's radiation energy density constant of the universe, and T represents the temperature of the universe at the time of measurement.

R represents the repulsive force of the universe's expansion, indicating that the universe expanded at the speed of light after the Big Bang. This is because all the mass of the baby universe was converted into energy during the Big Bang, and after Big Bang, the primordial universe began to expand at the speed of light. Planck's radiation energy density constant ω of the universe is a constant that appears in Planck's "Ueber das Gesetz der Energieverteilung im Normalspectrum" and has the following value:

$$\omega = \frac{8\pi^5 k^4}{15c^3h^3} = 7.56573 \times 10^{-16} J \cdot m^{-3} \cdot K^{-4},$$

where k is the Boltzmann constant, c is the speed of light in vacuum, and h is the Planck constant.

Over time, the primordial universe became the present-day universe.

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References

1. Planck units.
2. Planck's Law.
3. M. Planck, (1900). Ueber das Gesetz der Energieverteilung in Normal spectrum.
4. T.C. Yoon, (2025). "On the Generation and Annihilation of Energy in the Early Universe".