

Space does not equal nothing theory

At the time of writing this article the most popular theory for the origination of the universe is the Big Bang Theory, where all matter was created at one instant in time and is expanding outward. The theory in this document is a more gradual process, where I believe the creation of matter is still happening now as it always has, but at such a slow rate that it cannot be perceived. The theory states that everything that occupies space including matter and energy has a positive value of enthalpy; empty space however contains a negative value of enthalpy, and nothing, or absence of space has a zero value of enthalpy. This therefore states that space and nothing are not the same thing. Particles and energy are constantly randomly created on a small scale within existing space, with an equal and opposite creation of space which the particles then occupy. The sum of the space, energy and particles equates to a zero value of enthalpy. This creation is in line with the entropic direction, and can only occur in pre-existing space. The pre-existing space barrier moves outward with time. As the barrier moves outward the volume in which matter is created increases, so the rate of creation is increasing. This has been happening forever, there is therefore not a need for a big bang, and the timeline can be extrapolated backwards towards time $t = -\infty$ where space volume $V=0$. This process, driving solar systems further away from each other at an increasing rate, would be the equivalent of a cosmological constant.

Definitions:

Energy (E): The measure of the capacity for work. /J

Mass (M): The measure of quantity of substance. /kg

Volume (V): The measure of space in three dimensions, length, width, height. /m³

Nothing: Outside the boundary of our universe, nothing contains no particles, no energy and occupies no space. Nothingness cannot be entered as it does not exist. Nothing is not the same as a vacuum of space. /no units

Space: Has a negative entity value and occupies volume. /m³

Entropy (S): The measure of disorder of a substance, which moves in the positive direction only. It is envisaged that the entropic direction is for the creation of particles and energy with a positive enthalpy value, and the equal creation of space with a negative enthalpy value, in which the particles reside. $\Delta S_{\text{total}} > 0 \text{ /JK}^{-1}$

Enthalpy (H): The measure of total energy of a thermodynamic system. As matter can be stated in energy form through the equation $E=mc^2$, then both matter and energy have positive values of enthalpy. A vacuum of space will therefore have a negative value of enthalpy. The total space of the universe would cancel with the total mass and energy to give a zero value of enthalpy, although the entropic direction prevents this from happening. /J

The sum of all positive enthalpy would be the sum of all the energy in the universe plus the sum of all the mass in the universe in energy terms.

$$\text{Positive Enthalpy} = \sum E + \sum m.c^2 \text{ /J}$$

The negative enthalpy would be the total volume of the universe, stated in Joules. An equation much like Einstein's equation relating mass to energy is therefore required, but relating volume to mass.

$$m = V\rho_{\psi}$$

where ρ_{ψ} = the average density of matter in the universe, which is expected to be a fundamental constant, and approximately equal to $1 \times 10^{-19} / \text{kgm}^{-3}$.

Therefore:

$$\text{Negative Enthalpy} = \sum V \cdot \rho_{\psi} \cdot c^2 / J$$

And equating to zero:

$$\sum V \cdot \rho_{\psi} \cdot c^2 = \sum E + \sum m \cdot c^2$$

Unlike the big bang theory, this theory would suggest an increasing value over time for rate of expansion of the universe, as it is proportional to the volume of space already created. Or put another way; the second order differential for mass of the universe is positive. $\ddot{m} > 0$ This positive rate of expansion would mean that the age of the universe is much older than previously thought, as going back in time the expansion rate would have been less. The age of the universe could even possibly be infinite. The timeline could be extrapolated backwards towards $t = -\infty$ where space approaches a volume of 0. This process is driving solar systems further away from each other at an increasing rate, and would be the equivalent of the cosmological constant. The particles created are expected to be much smaller than those witnessed so far, their near zero mass making the detection difficult if not impossible. The space created would also be near zero in size, but over time this has created the whole universe. Particles can only be created within existing space; therefore there is a boundary to the universe. The boundary although increasing in size cannot be crossed, as there is no space in which to enter.

The large density of matter at the centre of the universe would result, as space has existed there for a much longer time, therefore more particles will have been created in that longer time, plus gravity would reduce the outflow of matter closer to the central point. The universe expansion due to this theory would have to be at a higher value than that of gravity, otherwise all the mass would be in the centre, but gravity has a larger effect than the universe expansion at close proximity, allowing for the creation of planets, stars and black holes. Gravitational force is inversely proportional to the distance between matter, the universe expansion is expected to be equal everywhere, although random in nature.

Earth may contain many particles, and within these particles is space. Within that space more particles would be created on a small scale. To a larger extent the orbit that the Earth takes around the sun occupies more space, which will be creating more particles than within Earth. This increase in particles will increase the mass of Earth slightly as it moves in its orbit. This creation of mass will be very small. A reasonably accurate figure for mass creation would be easier calculated from a known rate of expansion of part of the universe, and the volume of that space for the experiment. The location of the edge of the universe may be difficult to work out though, as gravity would reduce the mass at the extremes, making the barrier less visible.

Another interesting point from the theory is that the main driver for the movement of the universe outwards is the creation of space. As the theory states that the creation of space releases energy, then that the main driver for movement is exothermic. This is counterintuitive to the Newtonian understanding of the movement of mass requiring force and hence energy usage to achieve normally.