

## Does matter evaporate?

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Does matter in the form of gravitational radiation evaporate/escape/leak/exhale into the Universe?

What is this infinite Universe, what is this infinite/eternal Time? What is this finite Space compared to Infinity? What is finite Time compared to Eternity?

We do not know whether the Universe is infinite or so limited and at the boundary everything disappears and accumulates there (is not reflected) and from there everything seems to travel on to infinity ( $\infty$ ), where the building blocks of the New Universe are.

If our space were infinite, the gravitational field would constantly expand, and with it matter would "evaporate/escape/leak/exhale" from Our Universe to the amount of matter 0. So space ends, gravitational field has been spatially limited from the very beginning, to the diameter of the Universe, at the edge the gravitational energy density = 0 or  $\neq 0$ . The present-day gravitational energy density at the edge of space? Is the rate of evaporation of the matter probably limited by the pressure of the gravitational field?

What was before, chicken or egg? Was the chicken a little different than it is today, was the egg a little different than it is today.

What was before, the gravitational (energy) field in the entire Universe or the material core as the source or. material cores as the sources of the gravitational field? Let's say that before there was the energy of the gravitational field, which collapsed into the nuclei of matter, those exploded at a certain critical size and density.

gravitational constant  $G_0 = 6.67408 \cdot 10^{-11} \text{ m}^3\text{kg}^{-1}\text{s}^{-2}$

speed of light in vacuum  $c_0 = 2.997\,924\,58 \cdot 10^8 \text{ m/s}$

gravitational acceleration, acceleration of gravity on Earth, norm  $g = a_{gz} = 9.80665 \text{ m/s}^2$

Gravitational field strength, gravitational acceleration, decreases with  $r^2$  distance from the center of mass  $m_0$ :

$$a_g [\text{m/s}^2] = G_0 \frac{m_0}{r^2} \quad (1)$$

gravitational field of mass  $m_0$  (today), homogeneous in a sphere of radius  $r_0$  (today), has energy, outside the sphere, all the way to  $\infty$ :

$$W_{gz} [\text{J}] = \frac{1}{2} G_0 \frac{m_0^2}{r_0} \quad (2)$$

gravitational energy density, decreases with  $r^4$  distance from the center of mass  $m_0$ :

$$w_{gz} \left[ \frac{\text{J}}{\text{m}^3} \right] = \frac{1}{2} \cdot \frac{G_0}{8\pi} \cdot \frac{m_0^2}{r^4} \quad (3)$$

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energy inside a homogeneous spherical masses, as if they were spherical shapes with matter evenly distributed inside:

$$W_{gn}[J] = \frac{1}{10} G_0 \frac{m_0^2}{R_0} \quad (4)$$

and the total gravitational energy inside + outside the sphere, approximately:

$$W_g = W_{gz} + W_{gn} = \frac{6}{10} G_0 \frac{m_0^2}{r_0} \quad (5)$$

which corresponds to the mass deficit:

$$\Delta m_0[kg] = \frac{6}{10} \cdot \frac{G_0}{c^2} \cdot \frac{m_0^2}{r_0} \quad (6)$$

$$\Delta m_0/m_0[] = \frac{6}{10} \cdot \frac{G_0}{c^2} \cdot \frac{m_0}{r_0} = \frac{6}{10} \cdot \frac{6.67408 \cdot 10^{-11}}{(2.9979 \cdot 10^8)^2} \cdot \frac{m_0}{r_0} = 0.44555 \cdot 10^{-27} \frac{m_0}{r_0} ; m_0[kg], r_0[m] \quad (7)$$

We expect a linear superposition of energies of all individual particles, or at least the strength of gravitational fields. Examples:

neutron, mass  $m_{neutron} = 1.6749 \times 10^{-27}$  kg, radius  $r_{neutron} \approx 0.45 \times 10^{-15}$  m,  
 (average mass density  $\rho = 4.38 \times 10^{18}$  kg/m<sup>3</sup>),  
 $\Delta m_0/m_0 = 0.44555 \cdot 10^{-27} \times 1.6749 \times 10^{-27} / (0.45 \times 10^{-15}) = 0.166 \times 10^{-39}$  (8)  
 (neutron star  $\rho = 8.4 \times 10^{16} - 1 \times 10^{18}$  kg/m<sup>3</sup>)

Earth, mass  $m = 5.97 \times 10^{24}$  kg, radius  $r = 6.37 \times 10^6$  m, ( $\rho = 5.5 \times 10^3$  kg/m<sup>3</sup>),  
 $\Delta m_0/m_0 = 0.44555 \cdot 10^{-27} \times 5.97 \times 10^{24} / (6.37 \times 10^6) \approx 0.418 \times 10^{-9}$  (9)

Sun, mass  $m = 2 \times 10^{30}$  kg, radius  $r = 6.9 \times 10^8$  m, ( $\rho = 1.4 \times 10^3$  kg/m<sup>3</sup>)  
 $\Delta m_0/m_0 = 0.44555 \cdot 10^{-27} \times 2 \times 10^{30} / (6.9 \times 10^8) \approx 0.13 \times 10^{-11}$  (10)

... in all cases relatively very small, always  $\Delta m_0/m_0 \ll 1$ . The larger the conglomerate of material particles more the mass deficit is significant due to the expansion of the gravitational field to this day into the Universe (depending also on the mass density). The radiation of other types of energy (heat, light UV-visible-IR,  $\gamma$ , ..., material particles, ...) is not taken into account.

Estimates: Dark energy in the Universe has a dominant share recalculated into matter at a density of  $7 \times 10^{-27}$  kg/m<sup>3</sup> (energy-mass  $6 \times 10^{-10}$  J/m<sup>3</sup>) - which is very low, but in the entire Universe this "in-commensurable" share is 68.3 %, the share of dark/invisible matter (in black holes, elsewhere?) is 26.8 %, and the share of visible matter is only 4.9 %. Perhaps this "scarce" dark energy is a remnant of a once somewhat denser energy that was not completely uniform/homogeneous, which by the nuclei collapsed into matter and that dark energy is the basis for "our" electromagnetic waves to propagate into "empty" space, on Earth and beyond. There is no perfect symmetry in nature/world, asymmetries create diversity.

What was before, before gravitational field? There was the Lord God, the Creator, who cannot entrust humanity with the Creative Power. God is eternal, for Him there is no yesterday/today/tomorrow, for Him everything is the same moment, all states occur at the same instant. He occupies all space to infinity, for Him the entire Universe is a single point.

*The previous implementations are not based on physical knowledge and descriptions of natural laws, they are just impulse for thinking.*

***Scientists claim, there is no matter as such, everything is just waves:***

Éduard Brézin (1938) ... Electricity was not invented by trying to make better candles. ...

David Hume (1711-1776) ... was deeply sceptical about the existence of objective reality, arguing that we cannot know the world as it is in itself, only as we experience it through our senses ...

Max Planck (1858-1947) ... there is no matter as such ... vibrations ... behind the forces governing matter is a "conscious, intelligent Mind or Spirit" as the "matrix of all matter" fundamental to existence ... a churchwarden from 1920 until his death, and believed in an almighty, all-knowing, beneficent God ...

Albert Einstein (1879-1955) ... 1917 introduction of cosmological constant ... biggest blunder ... 1954 The word God is for me nothing more than the expression and product of human weaknesses, the Bible a collection of honourable, but still primitive legends ...

Former atheist: My argument for why there is most likely a God. The probability of the laws of physics in our universe being able to support life is very small compared to the probability of a lifeless universe. ...

Heinz Pagels (1939-1988) ... the visible world is neither matter nor spirit; the visible world is the invisible organization of energy. ...

Roger Penrose (1931) ... the universe exists because it began with a slight imbalance between matter and antimatter ... 2025 ... the "accidental" or "coincidental" creation of our universe is an impossibility. ...

... Penrose's math exposed the illusion of "random chance" behind our universe's existence. ... God Exists? The math says yes. The scientific elite still can't say it out loud. ...

Implementation of equations (1), (2), (3), (4), (5), (6), (7) see:

<https://www.mkx.si/Marijan.Kozelj/zep37gravitenerg-EN1712MKozelj.pdf>

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