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<Space particle dualism theory (Quantum Gravity)>

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<General Introduction to Space Particle Dualism Theory>

According to space particle dualism theory (SPD) every particle carries its own quantum of space, which is a complex 2-sphere with the radius:

$$R_{\mathbb{C}} = \frac{2\, G_{\mathbb{C}}\, E}{c^4}$$

With:

$$G_{\mathbb{C}} = \frac{k_e\, e^2}{m_p^2}$$

These quanta of space are called elementary spaces. They overlap and form our well-known three dimensional space. We can characterize the dimensionality of this granular space as:

$$D = 2 + \left(1 - \frac{1}{\sqrt{n}}\right)$$

With n being the number of connections from one elementary space to other elementary spaces. In a first approximation n can be estimated as:

$$n_{\mathbb{C}} \approx \left(\frac{k_e\, e^2}{10\, G_{|\mathbb{Y}|}\, m_p^2}\right)^2$$

More precise calculation yield:

$$n_{\mathbb{C}} = \left(\frac{1}{2}\, a\, m_e^3\, \frac{l_P^2\, m_e^2\, c^{2^{-\frac{3}{2}}}}{h^2}\, \frac{\lambda_{\text{crit}}}{l_{PL}}^{-2}\right) + \left(a\, m_e^3\, \frac{\lambda_{\max}}{l_{PL}}\right)$$

$$a = \frac{96\, {G_{\mathbb{C}}}^3\, \sqrt{2}}{V_P\, 3\, c^6}$$

The value of this granular dimensionality in the quantum vacuum yields:

$$D \approx 2.999999999999999999999999999999999991$$

Which means that every difference in granular dimensionality can only appear at the 36^{th} digit after the decimal point. This is why it is 10^{36} times weaker than electromagnetism.

When placing an electron into a quantum vacuum (QV), then the virtual photons that are emitted by the electron cause an increase in the density of the QV and therefore the granular dimensionality in the surrounding space.
If all particles are only allowed to move on the interconnected 2-dimensional surfaces of these elementary spaces, then regions where there are more elementary spaces have more pathways leading through them. That is what we call gravity.

There is gravity caused by virtual photons, characterized by

$$G_{|\mathbb{Q}|} = \frac{G_{|\mathbb{Y}|}\, k_e\, e^2}{\hbar\, c}$$

And gravity caused by virtual gluons, characterized by

$$G_{|\mathbb{Y}|} = \frac{G\, \mu_{Fe}\, (m_p + m_n)}{6\, m_{B_{Fe}}}$$

The gravitational force between two masses is accordingly given by

$$F_{G_{|\mathbb{Y}|}} = G_{|\mathbb{Y}|} \times \frac{n_{q_1}\, n_{q_2}}{r^2} = G_{|\mathbb{Y}|} \times \frac{|\mathbb{Y}|_1\, |\mathbb{Y}|_2}{r^2}$$

With $|\mathbb{Y}|$ being the cardinal hypercharge, which is essentially the number n_q of quarks.

The gravity caused by cardinal hypercharge is infinite in reach, while the gravity caused by cardinal charge is only 40 meters. Beyond that the elementary spaces of virtual particles are too small to contribute to granular dimensionality.

Evidence for a correlation between the chemical composition of test objects and the gravity between them has been found by various researchers, most notably by E. Fischbach, D. Sudarsky, A. Szafer, C. Talmadge, and S. H. Aronson, Phys. Rev. Lett. 56, 3 (1986).

Speed dependent time dilation can be explained by the uniform growth of elementary spaces, which equals a change in the speed of light, and which is perceived as time dilation.

Gravitational time dilation can be explained by the gravitational body changing the granular dimensionality of the background space, and thereby weakening the gravity between test objects within that gravitational field. This corresponds to a change in the strength of (hypercharge) gravity.

All the local effects of general relativity are realized in SPD, while the problems GR causes in cosmology are avoided.
In GR the vacuum energy leads to the vacuum catastrophe. In SPD this is avoided, because similar to the cosmology of Newtonian physics, gravity from different directions cancels out, so that the universe doesn't collapse.
In GR the chance for a flat universe is only 1 in 10^{62}. In SPD the universe must have a flat geometry, because what GR interprets as space-time curvature are only differences in the density of granular space.

Superpositioning and entanglement is explained by stating that we coexist in all worlds which are presently indistinguishable. The logarithm of the number of worlds is entropy.

The cosmology of SPD is dominated by a concept called 'entropic expansion'. It states that space expands in order to compensate the entropy increase in black holes. The entropy of a black hole depends on its surface area, and that is why it grows exponential.
Accordingly the Hubble parameter at different times is given by:

$$H = \frac{H_0 - H_{min}}{t_0^2} \times t^2 + H_{min}$$

$$H_{min} = \frac{M_{DH_{min}}^2 H_0}{M_{DH_\mu}^2}$$

With M_{DH_min} being the minimal mass of dark matter black holes, which can be calculated using the dynamics of elementary spaces, and M_{DH_μ} being the present average mass of supermassive black holes.

From this follows a time-redshift equation:

$$t = \frac{3\,c\,z}{H_0 - H_{min}} - \frac{2}{3} + \frac{H_{min}}{c}$$

For the age of the CMB this yields $t_{CMB} = 4.4883577 \times 10^{13}$ years.

This can be used to calculate the abundance of dark matter in the Milky Way:

$$q_{dark} = \frac{n_* M_{*_\mu}}{\left(t_0 R_* q_{BH} M_{BH_\mu}\right) + \left(t_0 R_* q_{left} M_{*_\mu}\right)}$$

$$q_{dark} = 90.36918138\%$$

This is exactly the 90% invisible matter that we know from star surveys. According to SPD all of what we call dark matter is ordinary matter stellar black holes and black dwarfs, while all the actual dark matter goes into the formation of primordial black holes that then evolve into supermassive black holes.

Element abundance can also be shown to support the longer figure for the age of the CMB and the universe.

Biography

<Sky Darmos>, <Hong Kong Polytechnic University>, <Quantum gravity researcher and etymologist. Published a 356 pages book on quantum gravity by the name "Quantum Gravity and the Role of Consciousness in Physics" (2014 – 2019; updated every quarter of a year) and a 520 pages work on etymology.>, <Recent publication: APA Newsletter on Computers and Philosophy, Volume 17, number 2 (spring 2018); pages 22 – 28. Link: https://c.ymcdn.com/sites/www.apaonline.org/resource/collection/EADE8D52-8D02-4136-9A2A-729368501E43/ComputersV17n2.pdf>.

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- The Primary Language of the Conference is English.

- Accepted papers will be published in the conference proceedings in their entirety upon payment of registration fees.

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