BLACK HOLE WHOSE ENTROPY IS EQUAL TO THE INVERSE OF FINE STRUCTURE CONSTANT.

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Abstract. The entropy of a black hole analyzed assuming that the surface area of events horizon belongs to a geometric object called torus.

Keywords. Black hole, entropy, geometry.

Starts with Bekensteing-Hawking equation describing the entropy of a black hole:

\[ S = \frac{1}{4} \frac{A C^3}{G \hbar} \]

The values of physical constants involved:

\( C = 299792458 \frac{m}{s} \)

\( G = 6.6735 \times 10^{-11} \frac{m^3}{Kg s^2} \)

\( \hbar = 1.054572 \times 10^{-34} \text{ J s} \)

Write the surface’s area of a torus:

\( A = 4\pi^2 Rr \)

Assigned to the larger radius of the torus the value:

\( R = N_A \) (it)

\( N_A \) refers to Avogadro’s number = 6.02214 x 10^{23}

As for the smallest radius:

\( r = \frac{1}{4} R \) (fig.1)
Define a certain dimensión of length as:

\[ L = \frac{1}{10^{35}} \text{m} , \text{ in the order of the Planck scale .} \]

Now write the area of this particular torus:

\[ \Theta = 4 \pi^2 R r , \text{ in wich } r = \frac{1}{4} R \]

Applying the assertion: mass <-> geometry <-> gravity, suppose that the parameter \( N_A \) experience a reduction (collapse) of \( 10^{23} \) orders of magnitude:

\[ N_{A0} = 6.02214 \times 10^0 \]

Summarize the formula for entropy:

\[ S_\Theta = \frac{\Theta c^3}{G \hbar} \]

Symbol \( \Theta \) (greek capital letter theta) stands for torus Surface as was described above. Therefore:

\[ S_\Theta = \frac{1}{\alpha} , \text{ or in other way :} \]

\[ S_\Theta \alpha = 1 \]

\( \alpha \) is the fine-structure constant, dimensionless value associated to electromagnetic interaction, equal to 0.007297353 (at zero energy).