MASSIVE STERILE (GHOST) NEUTRINO EQUATION, MSN

$$\textbf{MSN} = \frac{me}{\alpha^{-1}} = 6.6474 \times 10^{-33} \text{ kg}$$

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Abstract

The massive sterile neutrino, MSN may possibly be a new standard model stable constant and a candidate for dark matter: 1/137.035999139 smaller than the electron.

It is postulated that the massive sterile (ghost) neutrino, symbol MSN, has a mass of 6.6474 $x10^{-33}$ kg. Utilizing the standard model equation of the electron rest mass divided by the inverse fine structure constant, within the 2014 NIST CODATA uncertainty limits. [1]

This calculation has been made, in part, due to a study by astrophysicists Esra Bulbul and Nico Cappelluti, entitled," Searching for the 3.5 keV line in the deep fields with Chandra: the 10 MS observations. [2][3] The result of the massive sterile neutrino equation of 3.728 keV is tantalizingly close to the 3.5 keV emission line found by four telescopes pointing in different sections of the sky. An anomalously brighter than expected line at 3.62 keV has been found in the Perseus constellation, closer to the MSN value of 3.728 keV.

Also, in a paper titled: "Massive sterile neutrinos as warm Dark Matter" by authors, A.D. Dolgov and S.H. Hansen, state: "We show that massive sterile neutrinos mixed with the ordinary ones may be produced in the early universe in the right amount to be natural warm dark matter particles. Their mass should be below 40 keV…" [4]

$$\textbf{MSN} = 6.6474 \times 10^{-33} \text{ kg} * c^2 / e = 3.728 \text{ keV}$$

where: c = 299792458 m s^{-1} (speed of light in vacuum)
me = 9.10938356 $x10^{-31}$ kg (electron rest mass)
α^{-1} = 137.035999139 (inverse fine structure constant)
e = 1.6021766208 $x10^{-19}$ C (elementary charge)

A conclusion is made that the emission line in the 3.5 keV range and the result of the Massive sterile neutrino as Warm Dark Matter paper (below 40 keV) [4]is the energy signature of the massive sterile (ghost) neutrino of the MSN equation of 6.6474 $x10^{-33}$ kg.

In his book, QED, The Strange Theory of Light and Matter, the great Richard Feynman states: *There is a most profound and beautiful question associated with a simple number, the inverse of the fine structure constant i.e. 137.03597. It has been a mystery ever since it was discovered more than fifty years ago, and all good theoretical physicists put this number up on their wall and worry about it. Immediately you would like to know where this number comes from: is it related to pi, or perhaps to the base of natural logarithms? Nobody knows. It's one of the greatest damn mysteries of physics: a magic number that comes to us with no understanding by man. You might say the "hand of God" wrote that number, and "we don't know how He pushed His pencil." We know what kind of a dance to do experimentally to measure this number very accurately, but we don't know what kind of a dance to do on a computer to make this number come out-without putting it secretly! [5]*

If the massive sterile (ghost) neutrino, MSN equation turns out to be correct, then the hundred-year-old mystery of the inverse fine structure constant value of 137.035999139, would be solved.

The inverse fine structure constant value would be defined as the ratio of the mass of the electron, m_e, and the mass of the massive sterile (ghost) neutrino particle, MSN i.e. the ratio between the two most massive stable elementary particles in physics.

Note: the atomic unit of momentum, $\hbar/a_0$, was a surprise outcome of the massive sterile neutrino, MSN, multiplied by the speed of light value, c, 299792458

$$\hbar/a_0 = MSN * c$$

where: $\hbar/a_0 = 1.992851882 \times 10^{-24}$ kg m s (atomic unit of momentum)
MSN = $6.64743835 \times 10^{-33}$ kg (massive sterile neutrino)
c = 299792458 (speed of light)

References

[1] CODATA group, National Institute of Standards and Technology
[2] Nico Cappelletti, Esra Bulbul Et al. Astrophysical Journal, 2018
[3] arXiv.org>astro-ph>arXiv:1402.2301 Cornell Univerɑsity Library
[4] A.D. Dolgov, S.H. Hansen, arXiv:hep-ph/0009083v3 17 Feb 2001
[5]Richard P. Feynman, QED, Princeton University Press, USA (1985)