

A New Derivation of the Frequency, Wavelength, Density, Angular Velocity, Mass, etc. of the Neutrino, Using Data from the Large IceCube Laboratory and the KATRIN Experiment, Together With the Mathematical and Physical Calculations of Saleh Research Group, 2026

Gh. Saleh 

Saleh Research Centre, Netherlands

Considering the data from the IceCube Neutrino Observatory, the calculated energy of the neutrino particle is 2 TeV to 20 TeV [1]. Since the neutrino is itself a particle within the spectrum of electromagnetic waves, the following relations may be written for it.

$$E_{IceCube} = hf \Rightarrow f = \frac{E}{h} \simeq 10^{26} \text{ Hz}$$

On the basis of the principle of equivalence [2], whereby the experiment is equivalent to the classical equations of kinetic energy and to Max Planck's invariably valid equation for electromagnetic waves, the following relations are obtained:

$$E_{IceCube} = E_{Planck} = E_k = hf = \frac{1}{2}m_n v^2$$

Therefore, the mass of the neutrino may be calculated:

$$hf = \frac{1}{2}m_n v^2 \Rightarrow m_n = \frac{2 \times 6.62 \times 10^{-34} \times 10^{26}}{(3 \times 10^8)^2} \approx 1.5 \times 10^{-24} \text{ kg}$$

According to the calculated mass, the neutrino proves to be approximately five hundred times the mass of the proton. That the result is an obvious contradiction, since based on KATRIN experiment [3] the mass of the neutrino must be close to the mass of the photon or lower. In order for the principle of equivalence to be observed, the ambiguous aspects of this matter must be taken into account.

In the case of visible waves, the late and great scientist Max Planck obtained his constant for visible waves, and thereby derived the elegant and robust law giving the energy of electromagnetic waves.

$$E = hf$$

For the generalisation of this law to all electromagnetic waves, it must be recognised that, in similar spectra, such as the spectrum of visible waves, gravitational waves or sub-photon waves, this law remains valid and applicable, subject to the determination of its own constant for those waves.

Therefore, in Max Planck's relation, its constant remains the enigma. Therefore, to obtain Planck's constant for the neutrino and its mass, the following methods are applied.

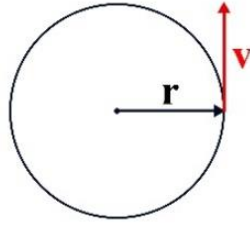


Now on the assumption that photon fission can be carried out, the following relations may be obtained [4, 5]:

$$v = r\omega \Rightarrow \omega_{Sub} = \frac{v_{Sub}}{r_p} = \frac{4.8 C}{1.2 \times 10^{-17}} \Rightarrow \omega_{Sub} = 1.2 \times 10^{26} \text{ Rad/s}$$

$$f = \frac{\omega}{2\pi} \Rightarrow f_{Sub} = \frac{1.2 \times 10^{26}}{2\pi} \Rightarrow f_{Sub} = 1.9 \times 10^{25} \text{ Hz}$$

$$\lambda = \frac{C}{f} \Rightarrow \lambda_{Sub} = 1.57 \times 10^{-17} \text{ m}$$



Since the neutrino particle is a sub-photon, that is, a photon that has been split and whose particles have been dispersed, the mass of each particle of a photon composed of five particles may be taken as one fifth of the mass of the photon.

$$m_n = \frac{1}{5} m_p = \frac{1.64 \times 10^{-36}}{5} = 3.28 \times 10^{-37} \text{ kg}$$

$$\rho = \frac{m}{V} \Rightarrow \rho_n = \frac{3.28 \times 10^{-37}}{\frac{4}{3}\pi(1.2 \times 10^{-21})^3} = 4.53 \times 10^{25} \text{ kg/m}^3$$

$$\frac{1}{2}mv^2 = h_s f \Rightarrow h_s = \frac{\frac{1}{2}(3.28 \times 10^{-37})(4.8C)^2}{1.9 \times 10^{25}} = 1.79 \times 10^{-44} \text{ J.s}$$

Using the parameters obtained for this neutrino, its energy may be determined:

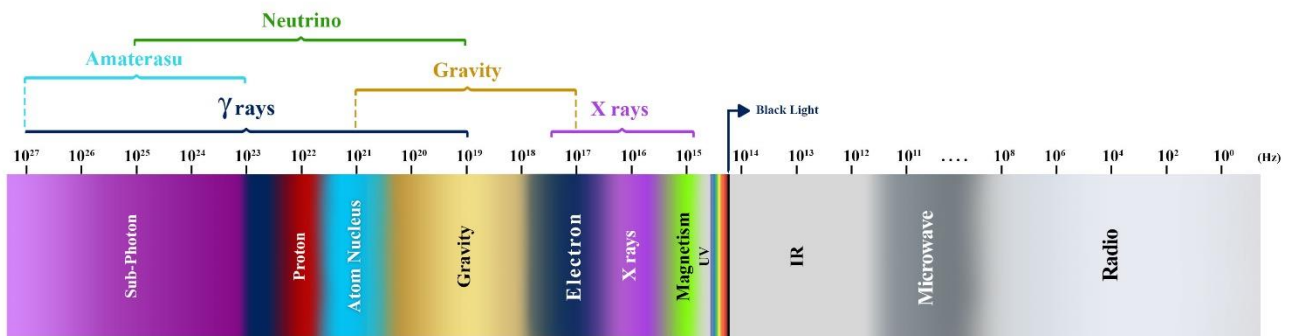
$$E = h_s f = 1.79 \times 10^{-44} \times 1.9 \times 10^{25} = 3.4 \times 10^{-19} \text{ J}$$

It is self-evident that this energy is very much lower than the calculated value.

The energy difference is due to the fact that, when neutrino particles leave the source, the source applies additional energy to them; because the particles are ejected, speed and energy are imparted to them, and the kinetic energy consequently becomes greater.

$$E_{Addition} = E_{IceCube} - E_{Real}$$





Physical Properties of the Neutrino					
Speed (m/s)	Frequency (Hz)	Wavelength (m)	Density (kg/m ³)	Mass (kg)	Energy (j)
4.8 C	$10^{19} - 10^{25}$	$10^{-17} - 10^{-11}$	$10^{24} - 10^{30}$	3.28×10^{-37}	3.4×10^{-19}

References:

- [1] Glauch, Theo, et al. Improved Point Source Analysis in the Northern Hemisphere – Paper Outline. IceCube Neutrino Observatory, 11 Jan. 2021, https://user-web.icecube.wisc.edu/~tglauch/updated_paper_outline.pdf.
- [2] Saleh, Gh. “The Principle of Equivalence in the Laws, Equations, Experiments, etc. in the Universe.” Saleh Theory, 11 Oct. 2026, <https://saleh-theory.com/article/the-principle-of-equivalence-in-the-laws-equations-experiments-etc-in-the-universe>
- [3] Kraus, Christine, et al. "Limit on sterile neutrino contribution from the Mainz Neutrino Mass Experiment." *The European Physical Journal C* 73.2 (2013): 2323.
- [4] Saleh, Gh. “New Derivation of Frequency, Wavelength, Density and Other Parameters of the Neutrino Particle — Subject of the 2026 Nobel Prize — Using Max Planck's Ever-Valid Law and the Fundamental Laws of Physics in the Universe (8 October 2026).” Saleh Theory, 08 Oct. 2026, <https://saleh-theory.com/article/new-derivation-of-frequency-wavelength-density-and-other-parameters-of-the-neutrino-particle-subject-of-the-2026-nobel-prize-using-max-plancks-ever-valid-law-and-the-fundamental-laws-of-physics-in-the-universe-8-october-2026>
- [5] Saleh, Gh. “New Discoveries About the Speed of Electromagnetic Waves 2024 Part C.” Saleh Theory, 06 Nov. 2023, <https://saleh-theory.com/article/new-discoveries-about-the-speed-of-electromagnetic-waves-2024-part-c>

