

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)

Gh. Saleh

Saleh Research Centre, Netherlands

A) Derivation of Neutrino Frequency by the Density Method

Data from the Ice Cube Observatory confirm the existence of high-energy particles and place their energy in the range of 2 to 20 TeV. The question, however, is where a particle of this energy is situated within the broader physical framework. To clarify the method of derivation, an illustrative example is offered.

Consider the process by which the early Mendeleev periodic table was completed: elements were classified into specific categories and groups according to their particular characteristics. Notably, the number of elements known at the outset was smaller than in the present table; over time, newly discovered elements were incorporated, and the table reached its mature form.

A comparable situation can be observed within the electromagnetic spectrum: certain waves may initially be unidentified, yet their position within the spectrum can, in time, be established through existing derivations and physical laws. Given that the neutrino particle possesses a defined energy, its position within the electromagnetic spectrum is sought here; establishing this position yields considerable further information. As a first method, Max Planck's law is therefore applied to calculate the energy of the neutrino, and this particle is examined further by means of classical physics and the principle of equivalence.

$$E_{Ice\ Cube} = 2\ Tev\ to\ 20\ Tev$$

$$E_{Planck} = h\nu$$

$$E_k = \frac{1}{2}mv^2$$

Where v is the speed of neutrino and is about 3.3C or 4.8C. so we have:

$$\frac{1}{2}mv^2 = 20\ Tev \Rightarrow \frac{1}{2}m(4.8C)^2 = 2 \times 10^{13}ev \Rightarrow$$

$$m = 9.65 \times 10^{-25}\ kg$$



Since the neutrino is regarded, within the universe, as a high-energy particle, its source may be attributed to the collapse of massive stars, to white holes, or to the Big Bang itself. However, the mass obtained by derivation does not correspond with the density and the mass of particles present, or possible, within black holes and within Big Bang plasma: under these derivations, the resulting neutrino mass is a thousand times greater than the mass of a proton. If a particle originating from a white hole or from the Big Bang is considered, the density of black holes is of the order of $10^{20} \text{ kg}/\text{m}^3$ and above, while for the Big Bang this density may be taken as of the order of $10^{40} \text{ kg}/\text{m}^3$ and more.

A clear contradiction therefore arises: the calculated value does not correspond with the density of these sources. In effect, the energy present in high-energy particles such as the neutrino substantially exceeds either the particle's kinetic energy or the value derived from Planck's law. The simple explanation is that the source of such high-energy particles invariably imparts additional energy to them beyond their own. That is to say, when a star undergoes collapse, when a white hole ejects particles, or when the Big Bang — the vast primordial explosion of the universe — expels neutrinos with an extremely high initial energy, additional energy is thereby conferred upon the neutrino particles, and the detecting apparatus invariably registers the total energy of the particle (the sum of the particle's own energy and that imparted by the source). A simple definition of high-energy particles such as the neutrino may nonetheless be offered: neutrino particles possess a mass intermediate between that of the photon and the sub-photon — that is, between 10^{-36} kg and 10^{-39} kg — with a corresponding density in the range of $10^{25} \text{ kg}/\text{m}^3$ to $10^{30} \text{ kg}/\text{m}^3$.

Furthermore, if the ratio of an element's density to its mass is considered, this ratio, per unit volume, is invariably equal to unity. The quotient of density divided by the mass of a given particle, element, or object is therefore always a unit value.

In light of the foregoing, a definition of the neutrino may be stated as follows: the neutrino is a particle possessing an exceptionally high density together with an exceptionally small mass. The approximate density of the neutrino may be taken as lying between $10^{20} \text{ kg}/\text{m}^3$ and $10^{40} \text{ kg}/\text{m}^3$, with its mass correspondingly inverse — namely, between 10^{-20} kg and 10^{-40} kg .

For the principle of equivalence to hold for the neutrino, it must therefore be recognised that the energy value indicated by the detector exceeds the true, actual value. The excess energy must accordingly be subtracted from the measured energy value in order to obtain the true energy, from which the mass, energy, frequency, and other parameters may then be calculated.

Note: where neutrinos originate from a white hole (one of the principal sources generating these particles within the universe), the density should be taken within the range of $10^{25} \text{ kg}/\text{m}^3$ to $10^{30} \text{ kg}/\text{m}^3$.

Just as stars, at the end of their life cycle, exhibit particular terminal states — such as becoming a red giant, undergoing a supernova, or producing a major explosive event — a comparable principle may be applied to white holes: not every white hole is capable of emitting neutrinos; rather, it must possess a relatively high density. Taking an average density for white holes, this falls within the range of



$10^{25} \text{ kg}/m^3$ to $10^{30} \text{ kg}/m^3$. Within this range, the energy of the emitted neutrino particle is examined below, by both the Planck method and the kinetic-energy method:

$$10^{25} \text{ kg}/m^3 < \rho < 10^{30} \text{ kg}/m^3 \Rightarrow 10^{-30} < m < 10^{-25}$$

$$E_k = E_{\text{Planck}} \Rightarrow \frac{1}{2}mv^2 = h\vartheta \Rightarrow$$

$$10^{19} \text{ Hz} < \vartheta_{\text{Neutrino}} < 10^{25} \text{ Hz}$$

The resulting derivations indicate a frequency range of 10^{19} to 10^{25} Hz, establishing neutrinos as high-energy particles of a nature intermediate between the photon and the sub-photon. Given the nature of the neutrino source and its associated properties, the majority of neutrinos are sub-photons originating from white holes or from the primordial Big Bang.

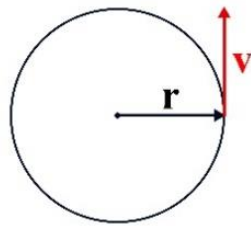
B) Derivation of Neutrino Frequency via the Decomposition of a Photon

Were it possible to split the photon — as atoms are split in the present era — the following relations could be derived:

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

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

In which, v is the speed of sub-photon — that is, the maximum photon speed — r is the maximum radius of rotation of the sub-photon — that is, the photon radius — and f is the frequency of this periodicity. We have thus, so far, arrived at an approximate derivation of two valuable parameters, namely the angular speed and the sub-photon frequency.



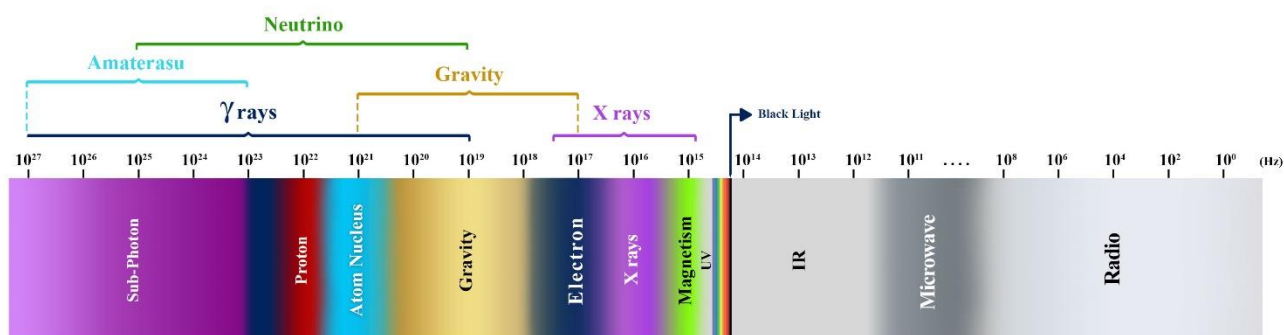
Given that the primary source of photons and electromagnetic waves is the electrons of atoms, and that these possess varying frequency tolerances, a tolerance range of 10^{23} to 10^{27} Hz may likewise be assigned when the photon is decomposed. Just as all waves possess such a tolerance, the same may be assumed for sub-photonic waves. If these waves are classified, they may be divided into three



categories: "mid-range frequency", "high frequency", and "low frequency". Considering the calculated neutrino frequency, it falls within the high-frequency category of sub-photonic waves.

A definition of the nature of neutrino may accordingly be proposed: just as atoms possess sub-atomic constituents, the photon may likewise possess a subordinate constituent — termed the sub-photon or neutrino — with a frequency in the range of 10^{25} Hz. Indeed, just as photons emanate from stars, neutrinos may be understood as emanating continually from white holes.

Speed (m/s)	Frequency (Hz)	Wavelength (m)	Density (kg/m ³)	Mass (kg)
4.8 C	$10^{19} - 10^{25}$	$10^{-17} - 10^{-11}$	$10^{25} - 10^{30}$	$10^{-30} - 10^{-25}$



If a definition of the nature of these high-energy particles is to be proposed, it must be stated that such particles carry additional energy imparted by their source during transfer, and that they may constitute either high-energy photons (gravity photons) or sub-photons. On this basis, the following range table may be proposed for their characteristics, together with a corresponding position within the electromagnetic spectrum diagram, as illustrated below:

Conclusion: Taking the Earth as a starting point: the larger system to which it belongs is the Solar System (the Sun, planets, and moons); larger still is the Milky Way galaxy (a system of suns); and beyond this lie the galactic clusters (systems of galaxies). Considered together, the cluster system may be likened to an ocean composed of H₂O. The universe may thus be understood as an ocean composed of galaxies.

Returning again to the Earth: it is composed of molecules (collections of elements). Elements are themselves composed of atoms (approximately 113 distinct atoms), which in turn are composed of the fundamental particles — electrons, protons, and neutrons. These, in turn, are composed of smaller particles termed photons (photons compressed together constitute the proton; photons arranged as a hollow sphere constitute the electron; a combination of these two constitutes the neutron) — three possible configurations of photon arrangement. Photons are, in turn, composed of still smaller



constituents, termed sub-photons (referred to variously as neutrinos, Amaterasu particles, Cidtonium, and other terms, depending on the source).

It may indeed be said that the photon itself is composed of smaller constituents, and that these smaller constituents may themselves be further divisible; as instrumentation and scientific knowledge advance, particles smaller than the photon will accordingly be identified. The essential point, however, is that particles smaller than the photon possess smaller masses but higher density, and that a constant mass and constant speed may be posited for such particles — just as the photon itself possesses a constant mass and constant speed. Were mass not constant, and speed variable, no physical laws could be said to hold. Accordingly, for physical laws — that is, invariably valid relations — to obtain, the mass, speed, and other parameters of particles must be held constant at a given juncture.

Saleh Theory predicts that the photon will be shown to divide into three primary sub-particles, each of which will, in turn, divide into further primary particles. The essential point remains that these particles possess constant mass, constant speed, and a defined kinetic energy. Where detectors register energies greater than theoretically expected, this is attributable to the fact that the sources generating these particles impart additional energy to them.

Where the scientific process is pursued with simplicity, fluency, impartiality, and patience, logical explanations and precise derivations for these particles may be readily obtained.

References:

- [1] [Saleh, Gh. "New Discovery for the Nature of Neutrinos and a Description of Their Structure." *4th TDAMM Workshop \(Organized by NASA's ACROSS initiative. 2025.*](#)
- [2] [Saleh, Gh. "New description for the nature of neutrinos." *The 84th Japan Society of Applied Physics \(JSAP\) Autumn Meeting 2023. 2023.*](#)
- [3] [Saleh, Gh. "A new explanation for the nature and other properties of neutrinos." *International Annual Meeting of the German Astronomical Society \(AG meeting 2023. 2023.*](#)
- [4] [Saleh, Gh. "Discovering the True Nature of neutrinos." *APS New England Section Fall Meeting Abstracts. 2022.*](#)
- [5] [Saleh, Gh. "New discovery about the nature of neutrinos and their structure." *APS Northwest Section Meeting Abstracts. Vol. 22. 2022.*](#)
- [6] [Saleh, Gh. "The neutrinos or gravitational fluxes." *2022 JINA-CEE Frontiers in Nuclear Astrophysics \(2022\): 29.*](#)
- [7] Saleh, Gh. "New Discovery for the Nature of Neutrinos and a Description of Their Structure." Saleh Theory, 24 Jan. 2022, <https://saleh-theory.com/article/new-discovery-for-the-nature-of-neutrinos-and-a-description-of-their-structure>

