

# Electromagnetic Field and Space-Time

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**Abstract:** How did the universe come into existence? This very question cannot be asked because everything came from energy without time. If the energy was not always there as time, then nothing would exist to ask. With this in mind, infinite energy is explained outside the realm of time and matter. Magnetic wavelets in a vacuum at the constant speed of light are shown as gravity force in the electromagnetic field. Gravity forces of the magnetic field interact with mass wavelets of the electric field and are curved from mass in finite energy.

## 1. Introduction

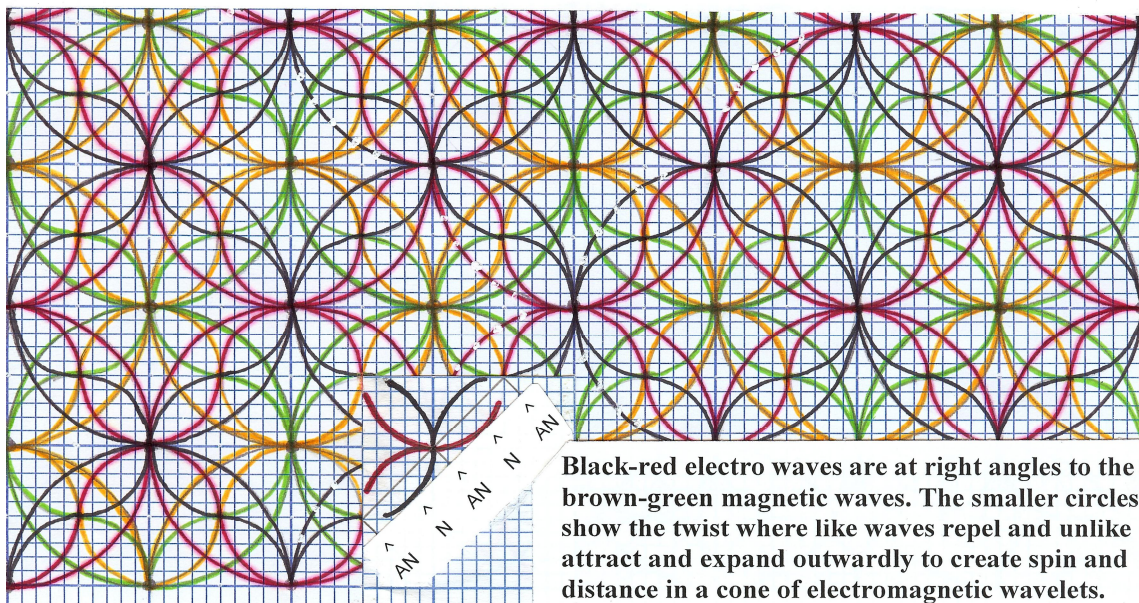
The electromagnetic field is comprised of standing wavelets in the opposite direction where direction is relative to the source of energy. Standing wavelets have electric and magnetic fields and the magnetic field provides the gravitational forces on the electric field. Gravity forces are very weak compared to the other forces of nature because the other forces are at the antinodes in the electric field while gravity forces are at the nodes in the magnetic field. Gravity forces in the magnetic field effect mass in the electric field at the constant speed of light. Photons are standing wavelets packing a punch as a particle at the antinodes. Energy is equal to frequency of the photon wavelets based on Planck's constant,  $E = hv$ .

## 2. Report and Figures

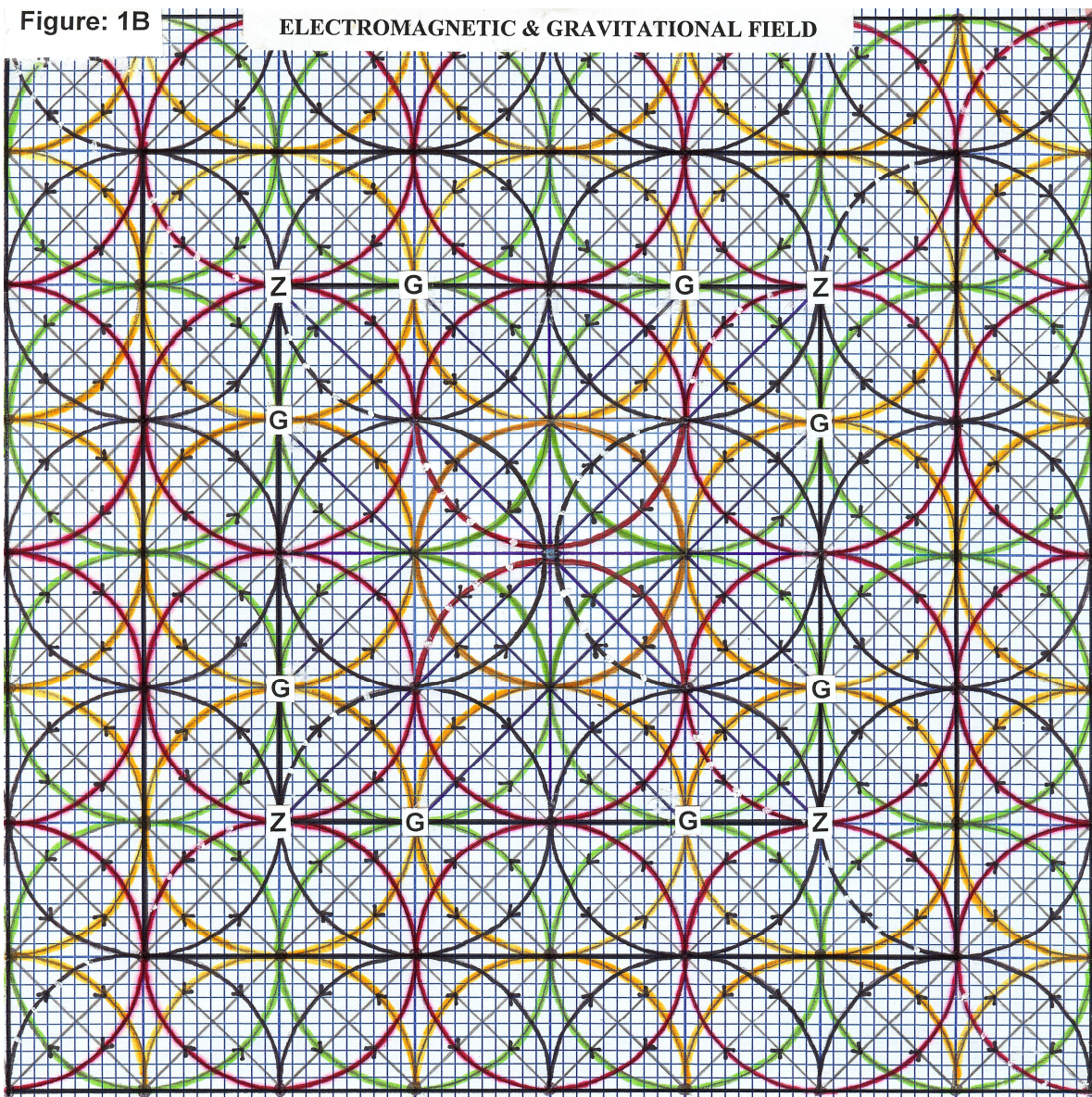
From Figure 1A below, energy is formed into half wavelengths at ultra high frequency standing waves. The black-red (dark) electric waves become transverse waves in the expansion process forming perpendicular to the brown-green (light) magnetic waves. As the half waves multiply from energy displacement at the antinodes, the expansion of the transverse wavelets becomes three dimensional as space in a sphere resulting in an endless unit without a boundary. The half waves are open-ended where the antinodes are at the ends and nodes in the middle such that each half wave keeps multiplying indefinitely to complete whole wavelengths in the electromagnetic field. Each half wavelet in a spiral is equivalent to two smaller half wavelets within completing whole wave-lengths where  $C = f \lambda$ .

Figure: 1A

ULTRA HIGH FREQUENCY WAVELETS



From illustration Figure 1B below, moving two steps in any direction from mass (center) and squaring, there are four complete green (light) circles in the square. On three steps from center and squaring, there are nine complete brown (light) circles in the outer square and so on in the square of the distance from mass in the magnetic field. The black-red electric waves and brown-green magnetic waves oscillate perpendicular to each other as circular and sinusoidal waves with electric charges propagating in the direction Z and magnetic current propagating in the direction G. This is likened to placing the palm of the right hand edgewise on the table with the thumb sticking up; then place the left palm facing down between the fingers of the right hand with the thumb extended out. The thumb on the right hand is the E vector oscillation for the electric field and thumb on left hand is the B vector oscillation for the magnetic field with propagation of electric energy in the direction of fingers on the right hand and propagation of magnetic energy in the direction of fingers on the left hand. Magnetic current is circular shown as brown and green circles around mass (center) and part of Pi propagating in direction G. The magnetic energy G is circular relative to the direction of electric energy Z. Light and gravity are propagating in the magnetic field at the square of the distance to mass (center). Holding the illustration up diagonally at eye level show how the transverse waves oscillate in the direction of propagation Z and G. The energy alternate in the electric and magnetic field where a change in one field will cause a change in the other.



Electric and magnetic wavelets expand into larger wavelets from the antinodes (displacement) energy of standing waves at twice the amplitude of the smaller wavelet giving distance to the field. The waves need to be visualized as a spectrum of different size wavelengths increasing in size moving outwardly, not one size wavelength as shown. The multi source pattern of the wavelets is energy left in the field as the electromagnetic spectrum after mass and gravity are condensed into finite energy. Gravity forces come from the brown-green magnetic waves inside the black-red electric waves Figure 1B (center) and an inward attraction force at the nodes that conserve the energy. Gravity magnetic forces are at the nodes when the mass electric forces are firing at the antinodes and visa versa. In Figure 1B, the black electric and brown magnetic are outward/inward circular waves respectively while the red electric and green magnetic are expanding/contracting sine waves respectively. Quarks deep in the cone apex include the black electric circular waves, the black electric sine waves and green magnetic sine waves as the proton while the brown magnetic circular waves, the brown magnetic sine waves and red electric sine waves are the neutron. Gluons are the amplitude of the wavelets like the e coupling constant but are much stronger in the cone apex holding protons and neutrons together. Beta decay come from the interaction of the black-red sine waves between the neutrons and protons. Electrons at the base of the quantum cone are the red-brown sine coupling waves and positrons are the black-green sine coupling waves. Electron(s) as a mass particle continue outwardly to interact with photon wavelets at the base of the quantum cone which is the amplitude of the e coupling constant. The e coupling constant, about 137.03597 is the amplitude for a real electron to emit or absorb a real photon [1]. A star is formed when a large amount of gas (mostly hydrogen) starts to collapse in on itself due to its gravitational attraction [2]. Space-time in general relativity is not flat but curved by the distribution of mass and energy in it [3]. Mass as ultra high frequency standing waves have energy where  $E = MC^2$ .

### 3. Conclusion

$$\text{Extended Equation: } \mathbf{E} = \mathbf{C} = \infty = \begin{matrix} \textit{Left Side} \\ \mathbf{ZG}^2 \end{matrix} = \begin{matrix} \textit{Right Side} \\ \mathbf{ZG}^2 \end{matrix} \quad \text{Where } \mathbf{ZG}^2 \text{ is total wave energy.}$$

Open-ended standing waves are on both sides of the equation where the speed of light is infinite on the left side and a constant relative to mass on the right side. Energy of the electric field propagating in direction Z times energy of the magnetic field propagating in the direction G is total wave energy. The difference from the classical electromagnetic wave is important to account for the inverse square distance of light and gravity relative to mass. It also accounts for the gravitational effect on mass when the magnetic quadrants are at the nodes relative to the electric quadrants at the antinodes. Vectors E and B in the direction of Z are three spatial dimensions in space with light and gravity from the magnetic field as the square of the distance to mass. Mass in the electric field already includes part of the magnetic field as subatomic forces; the remaining magnetic field energy is light and gravity relative to mass. The remaining electric field energy not subject to the magnetic effect on mass is dark energy becoming infinite from the open-ended standing waves. Mass as finite energy is receding as a result of the different gravity levels in the field evidenced by the redshift and distance. Electromagnetic field waves have intermittent time frames at the nodes of standing waves resulting in mass energy as past, present and future like motion pictures projected on screen. Electromagnetic waves are infinite from open-ended standing waves moving toward the static equilibrium outside the realm of time and matter. Each photon is a complete wavelength within a half wave particle shell and frequency of the wave is independent of time. The strength of the field is space and movement within space is the time; hence, space-time. Thus, the speed of light is infinite and finite only when there is mass relative to it which is energy in the form of curved space-time. Energy from one universe applies to both sides of the equation with finite energy as time on one side and infinite energy at absolute rest without distance and time on the other side. It is not that time had any beginning; it is that time does not exist in the infinite universe of open-ended standing waves.

### References

- [1] Feynman, R.P. (1988). *QED The Strange Theory of Light and Matter*, Princeton University Press, p129.
- [2] Hawking, S. (1996). *The Illustrated A Brief History of Time*, Bantam Books, p105.
- [3] Ibid, pp 40-42.

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