



Beyond the Standard Atomic Model: Photon as the Primary Building Block



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Abstract

Since ancient times, humanity has attempted to identify the fundamental building blocks of matter. Early civilizations described nature through four classical elements, while modern science established atoms and later subatomic particles as the basis of material structure. The periodic table further organized matter through combinations of protons, neutrons, and electrons, with hydrogen commonly regarded as the simplest atomic element.

This study proposes an alternative conceptual framework in which the photon is considered the fundamental structural unit of all matter. According to this model, electrons, protons, and neutrons are interpreted as different configurations of photons. Specifically, the electron is described as an organized array of photons rotating along the surface of an imaginary sphere without a central core. The proton is proposed as a dense and compact spherical accumulation of photons. The neutron is introduced as a composite structure consisting of a proton-like core surrounded by an electron-like shell.

Based on this framework, the photon is presented as a “new atom”, the primary constituent underlying all material existence in the universe. Extending this hypothesis, a deeper structural entity named Cidtonium is introduced as the proposed constituent of the photon itself and consequently the foundational element of all particles and matter.

Within this proposed framework, the photon is not only regarded as the foundational constituent of elementary particles but also as the underlying building block of all cosmic structures. Accordingly, astronomical systems ranging from stars and planets to galaxies and large-scale structures of the universe are interpreted as emergent organizations of photon-based matter across different scales of complexity.

This work presents a conceptual model intended to stimulate discussion on alternative interpretations of matter organization and hierarchical particle structure beyond conventional approaches.

Photon and Sub-Photon Particles

It was believed that the universe consisted of four fundamental elements: Earth, Wind, Water, and Fire. Over time, human knowledge evolved, revealing that the universe is composed of smaller components known as molecules. Molecules are further divided into atoms, which consist of electrons, protons, and neutrons. Saleh Research Group proposes that subatomic particles are themselves composed of even smaller constituents termed Photons [1-8].

An analysis of elemental atomic masses reveals that hydrogen has an atomic number of one. As the number of protons, neutrons, and electrons increases, thereby increasing the atomic mass, the density also increases.

Calculations indicate that planet Earth, as a collection of primary elements, has a density of approximately $5.5 \times 10^3 \text{ Kg/m}^3$. Similarly, the Sun and the Moon possess specific densities.

$$\rho_{\text{Earth}} = \frac{m_{\text{Earth}}}{V_{\text{Earth}}} = 5.5 \times 10^3 \text{ Kg/m}^3$$

$$\rho_{\text{Moon}} = 3.3 \times 10^3 \text{ Kg/m}^3$$

$$\rho_{\text{Sun}} = 1.4 \times 10^3 \text{ Kg/m}^3$$

Considering the celestial objects, White dwarfs are composed of dense collections of protons, while magnetars consist of neutrons within a very small volume, resulting in extremely high density.

$$\rho_{\text{Magnetar}} = 5 \times 10^{17} \text{ Kg/m}^3 \approx \rho_{\text{Neutron}}$$

The formation of a white dwarf or a magnetar requires novae or supernovae explosions. Under extreme pressure, impact, and heat, the standard atomic structure collapses. This elimination of the vacuum between the nucleus and the electrons allows protons or neutrons to be packed tightly together.

In fact, the empty space between the nucleus and the electrons no longer exists, and white dwarfs or magnetars are formed by the combination of protons or neutrons, and this high density ($5 \times 10^{17} \text{ Kg/m}^3$) has been created.

Defining the nature of black holes and the Big Bang phenomenon requires consideration of their immense densities:

$$\rho_{\text{Black Hole}} \approx 10^{20} \text{ Kg/m}^3$$

If the initial volume of the Big Bang were assumed to be approximately the size of a football pitch, the resulting density would be:

$$\rho_{\text{Big Bang}} = \frac{m_{\text{Big Bang}}}{V_{\text{Big Bang}}} = \frac{10^{53}}{\frac{4}{3}\pi(100)^3} \approx 10^{46} \text{ Kg/m}^3$$

Given the densities of white dwarfs and magnetars below 10^{20} Kg/m^3 compared to black holes 10^{20} Kg/m^3 to 10^{30} Kg/m^3 and the Big Bang 10^{40} Kg/m^3 to 10^{50} Kg/m^3 , it is posited that if black holes-maintained photon characteristics, such densities would be unattainable. Instead, the photon structure collapses into its constituent particles, Cidtonium [9].

This elimination of internal spatial gaps allows Cidtonium, Irenium and Ilitium particles to aggregate, initiating black hole or Big Bang formation[10].

Sub-Photon: Cidtonium

Sub-Cidtonium: Irenium

Sub-Irenium: Ilitium

Important Note

Considering the density structure that exists within black holes and at densities beyond those of black holes, such as those associated with the Big Bang, photons can no longer be considered capable of forming their fundamental structure. If photons were the building blocks of the Big Bang, then, given the mass and volume of a photon and the total mass of the universe, the volume of the initial Big Bang mass would be extremely large, reaching a scale comparable to the distance between Earth and Jupiter. This would be in conflict with the established observations and assumptions concerning the Big Bang.

Therefore, according to this proposed model, the structure of black holes consists of Cidtonium + Irenium, whereas the initial structure of the Big Bang consists of Irenium + Ilitium.

Notice

Observation of the night sky reveals luminous points which, through powerful telescopes, are identified as galaxies containing billions of stars, spanning thousands of light-years, and hosting numerous planetary systems. Just as atoms (with a variety of over a hundred types) have subatomic particles, it is proposed that the photon in the micro-universe consists of its own sub-photons. It is plausible that both macro and micro scales comprise diverse internal structural layers.

References

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