The Tetrahedron Conjecture: Constant Creation, Closed Universes, Cosmic Evolution, and Determinism

Abstract

Lucretius[1] [99 BC-55 BC] was right! The famous poet and author of, "De Rerum Natura" [On the Nature of Things] believed that every object in the world was an elaboration of one fundamental form of matter. That matter was a manifestation of a single, unending process of creation. Lucretius' theory was quite different from the "Hypothesis of the Primeval Atom" proposed by Father Georges Lemaitre[2], and later dubbed, "The Big Bang Theory" by Fred Hoyle[3]. The Big Bang Theory maintained that all the matter in the universe was created in a single, explosive event at the beginning of time. Numerous different types of matter were created in a single instant. As the universe expanded from its original tiny size, its matter cooled, congealed, and took its present form.

An updated version of Lucretius' theory, the Tetrahedron Conjecture, has numerous advantages over the Big Bang Theory. It explains:

- The evolution of the cosmos
- Dark energy and cosmic inflation

[1] Lucretius: "De rerum natura" (1475–1494), digitised codex at Somni
[2] LeMaitre, Georges "Un Univers homogène de masse constante et de rayon croissant rendant compte de la vitesse radiale des nébuleuses extra-galactiques". Annales de la Société Scientifique de Bruxelles 47: 49. April 1927
[3] Hoyle, Fred "Frontiers of Astronomy" Heinemann Education Books Limited, London, 1955

- Why the night sky is dark [Olbers'[4] paradox] and stellar voids
- Uniformity of mass and charge for each type of subatomic particle
- The existence of positive and negative electrostatic and magnetic forces
- The structure of nuclei and atoms
- Wave-particle dualism and light polarization
- Mass, gravitation, and dark matter
- Time dilation and length contraction.

Contents

[4] Olbers, Heinrich (1797) "Abhandlung über die leichteste und bequemste Methode die Bahn eines Cometen zu berechnen" Weimar: Industrie-Comptoir.

Constant Creation

1. Protomatter and the void

Under Lucretius' theory of Constant Creation, there was no bang when the universe started. The universe was created in several steps.

Figure 1-A: The Void

The first step was creating the Void [figure 1-A]. In the creation process, energy emitted by creating space was absorbed by making protomatter. The amount of energy absorbed depended on the size of the protomatter particles produced, so there was always a close balance between the energy produced and the energy absorbed. Because little surplus energy was created, the process was smooth and non-violent. The slight imbalance between the energy created and absorbed in the creation process provided the kinetic energy for the newly contiguous spheres of protomatter to collide and fuse together, creating baby universes. The process continues today.

2. Universes grow by accretion

These tiny universes gradually grew by accretion, with the protomatter, or "dark energy," required for expansion coming from the void, outside the universes. Each universe was held together by the minute forces between the spheres of protomatter. Much like water droplets, these universes had surface tension at their exteriors. The barriers created by this surface-tension provided clear boundaries between the universes and the Void.

As these early universes grew, their skins thickened, and the pressures within them increased. Under pressure, the spheres of protomatter grouped into a more compact and stable form. The most stable form they could adopt was that of a mathematically imperfect tetrahedron, with bowed sides. The tetrahedron was formed from four spheres of protomatter (Figure 2-A).

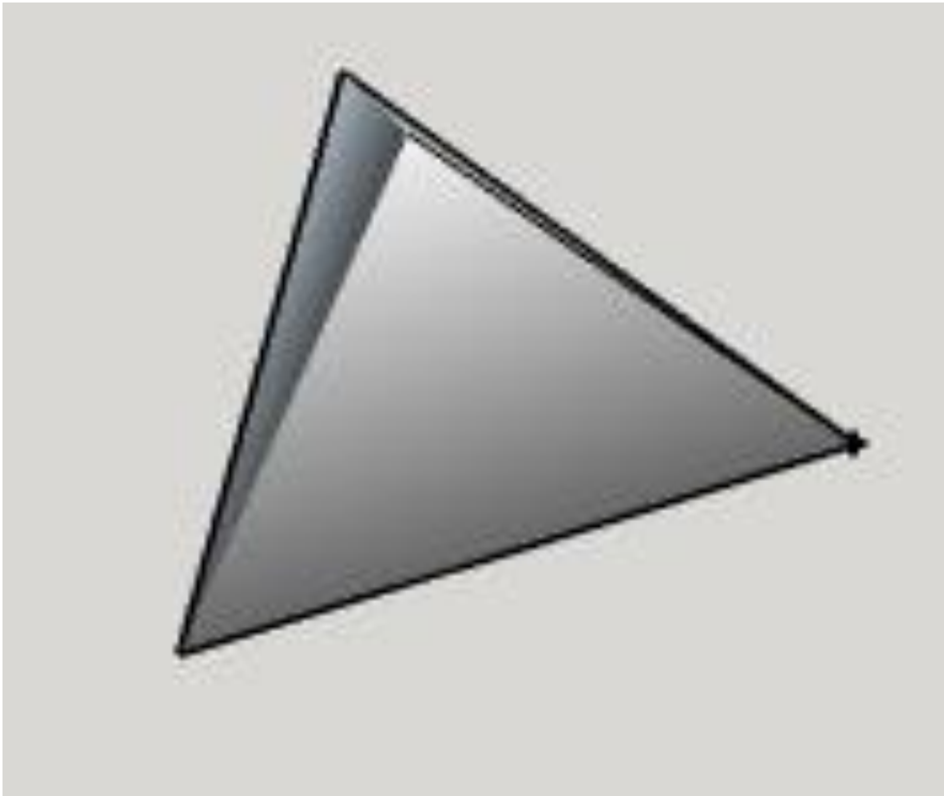


Figure 2-A: Mathematically Imperfect Tetrahedron

When protomatter is compressed into a tetrahedron, it leaves behind space and kinetic energy. Thus, protomatter and other particles in the newly created universes gained the energy to bombard each other. Structures that were less robust than tetrahedra [cubes and spheres for example, or lopsided tetrahedra made of protomatter particles of unequal size] were destroyed by relentless bombardment. Unusually large and small protomatter particles were also destroyed and reformed in the bombardment, so they conformed [within tolerances] to an optimum size that maximized their stability and robustness [resistance to bombardment]. Only the most robust structures survived in the early universe. Geometry determined robustness.

The imperfect tetrahedra then compressed further, into three possible stable forms:

- A right-handed [clockwise] truss [Figure 2-B],
- A left-handed [anticlockwise] truss [Figure 2-C],
- A mathematically imperfect decahedron [10-sided roundish object [Figure 2-D].

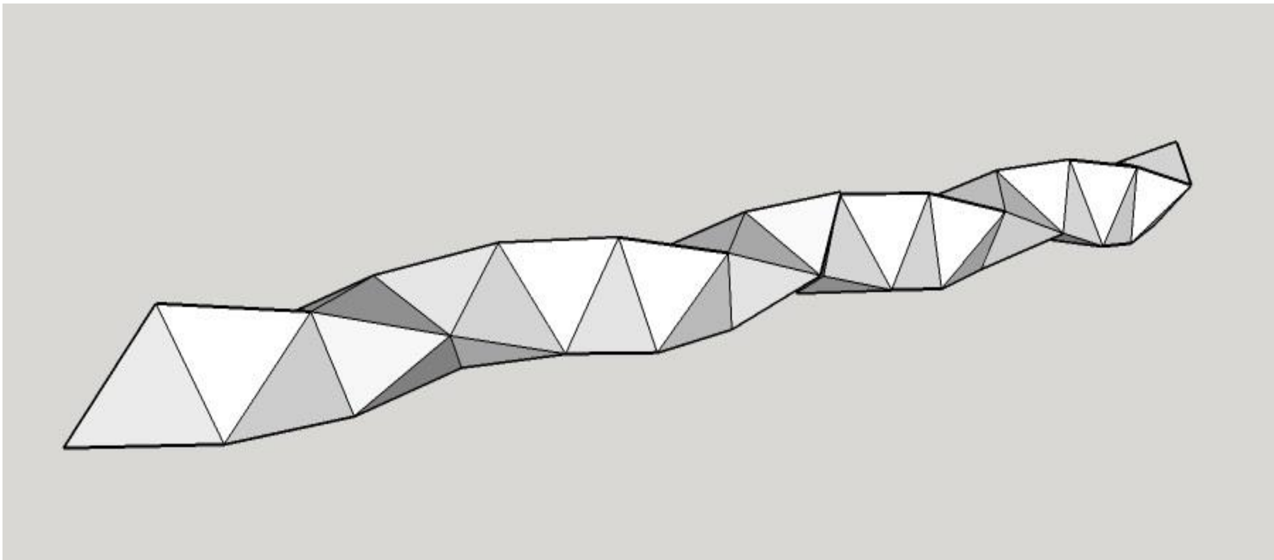


Figure 2-B: Right-handed [clockwise] truss

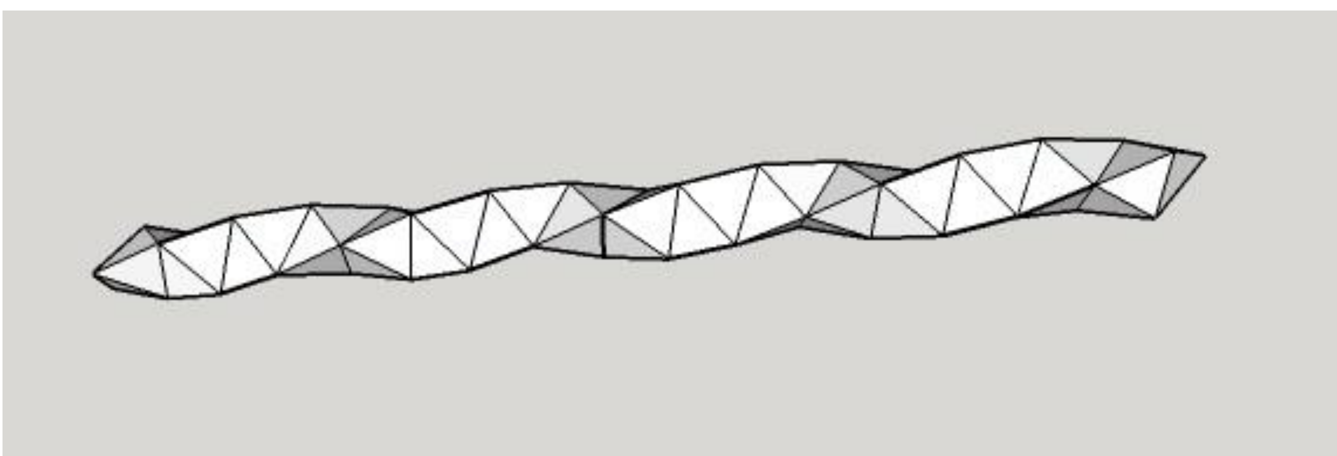


Figure 2-C: Left-handed [anticlockwise] truss

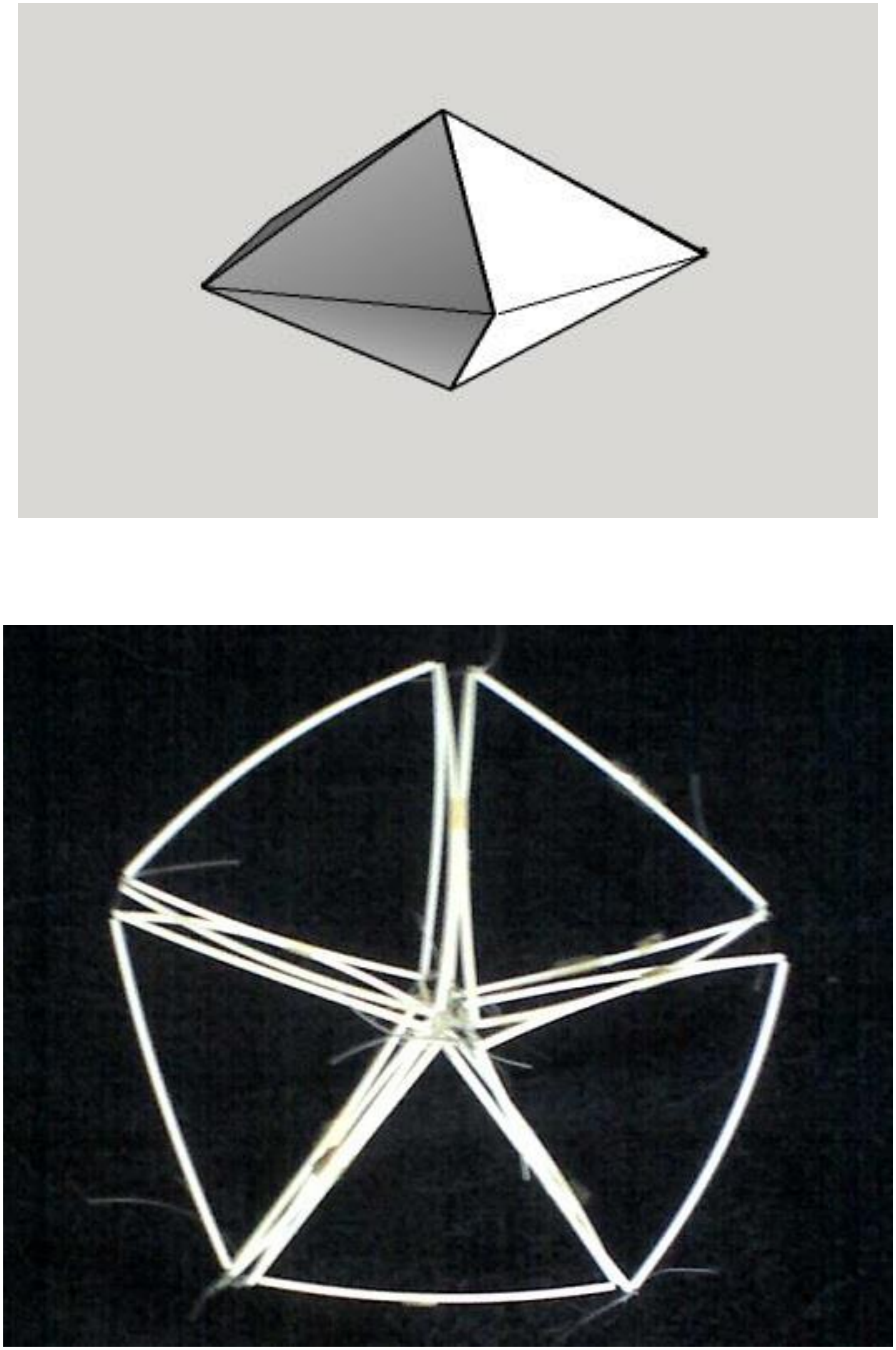


Figure 2-D: Mathematically Imperfect Decahedra

The trusses and decahedra were denser than the surrounding mass of protomatter particles. As a result, they sank towards the densest area of the universe, near its external surface where the surface tension forces were strongest. Meanwhile, the less densely packed protomatter floated away from the high-pressure area at the edge of the universe, towards the lower pressure area at the center of the universe.

3. Decahedron Aggregation and the Closed [Bubble] Universe

The external surface of the universe was constantly being struck by particles from the void as it grew by accretion. The particles from the void colliding with the universe were protomatter particles, and aggregations of protomatter particles [other small universes]. The kinetic energy of the impacts from inside and outside the universe made the outer, decahedron-rich layer of the universe vibrate. The vibrating decahedral particles aggregated to form loosely bound, roughly spherical particles that were less dense than the surrounding sea of trusses and protomatter. These less dense aggregate particles floated towards the low-pressure area at center of the universe.

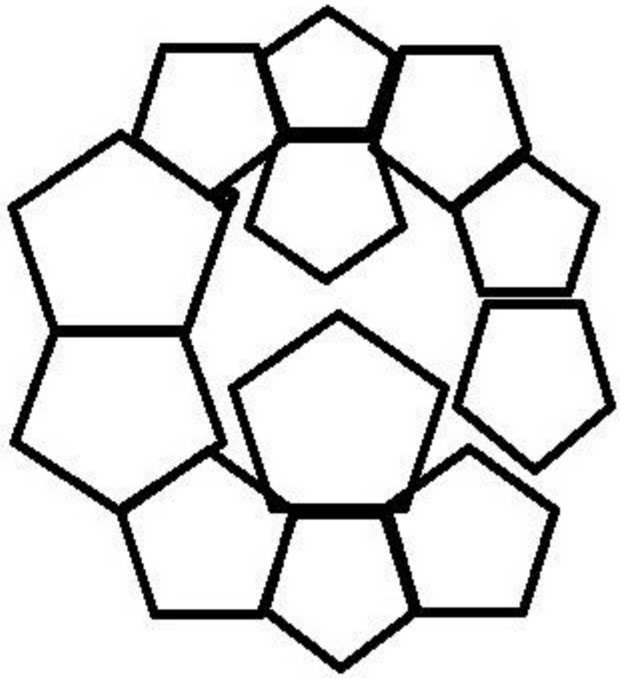


Figure 3-A: cross-section of loosely-bound, roughly spherical 3-d Higgs[5] particle.

Eventually the aggregated particles formed their own low-density sphere at the center of the universe. There they separated from the protomatter of the universe like oil from water. At the boundary between the aggregated particles and the protomatter, surface-tension formed a skin. This was the inner surface of the skin of the universe. At reduced pressure, the aggregated particles were no longer stable. They dissociated into their component decahedra, creating a hollow, bubble interior of the universe that was devoid of matter other than decahedral particles.

[5] Higgs, Peter (1964) "Broken Symmetries, Massless Particles and Gauge Fields" Physics Letters 12 132 (1964)

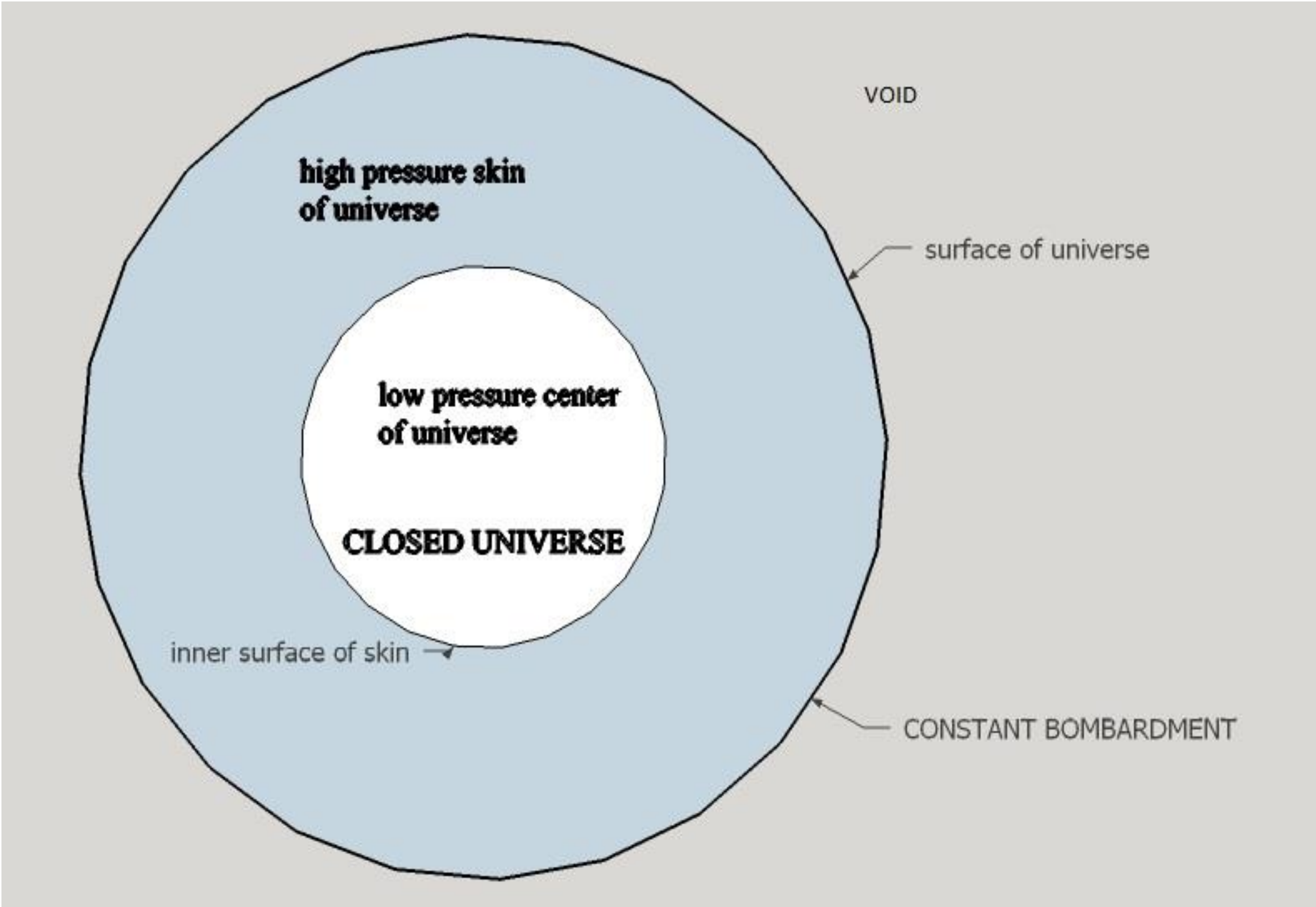


Figure 3-B: High-pressure and low-pressure parts of universe

The disassociated decahedra [from former Higgs particles], now recognizable as ether particles, filled the hollow center of the universe like an atmosphere. They became structural components of the universe, exerting enough ether pressure on the inner surface of the skin of the universe to prevent the universe from collapsing. Any protomatter particles remaining in the center of the universe were absorbed back into the skin of the universe. Ether particles filled the Closed Universe. The skin of the universe separated the Closed Universe from the external Void.

Even today, decahedral particles are formed in the skin of the universe from five tetrahedral particles. They form critical components of matter, maintaining the geometry and stability of the trusses in quarks. Once decahedral particles have left the skin of the universe, transported there as Higgs bosons, they become ether particles, free flying structural components of universe. The ether particles form a low-density bubble at the center of the universe. As soon as the bubble formed, it expanded, driven by Higgs particles, quarks, and leptons [section 4, below] "boiling" out of the skin of the universe into the low-pressure central area. The universe quickly developed a balloon structure. It created a large, low-density center and a thin, high-density skin.

The echoes of the creation and expansion of the universe were discovered in the twentieth century:

- In 1927, Edwin Hubble[6] propounded his law that the velocity of galaxies receding from Earth [measured by Doppler-shift] is approximately proportional to their distance from the Earth. This is a consequence of the universe expanding, at a steadily increasing rate.
- In 1964 Arno Penzias and Robert Wilson detected microwave background radiation. Background radiation can be interpreted as evidence of an unbroken skin emitting and absorbing radiation.
- In 1998 measurements of the distance to type 1a supernovae[7] and Cepheid[8] variable stars showed that the universe was expanding at an accelerating rate. The accelerating expansion could be largely explained by the surface area of the outer surface of the skin of the universe increasing and being hit by more and more protomatter particles.

The Closed Universe also explains Olbers' paradox, Stellar Voids, the invariant cosmic background temperature, and the lack of vestiges of creation:

3.1 Olbers' Paradox

Olbers' paradox, named after Heinrich Olbers (1758–1840), is the problem caused by the night sky being dark. In an infinite universe, there should be a star visible in every direction. The night sky should be a blaze of light. Only in a closed universe, can the night sky be dark.

[6] Hubble, Edwin (1929). A relation between distance and radial velocity among extra-galactic nebulae". PNAS. 15 (3): 168-173

[7] Type 1a supernovas are binary star systems. Matter is transferred from the smaller to the larger star. When the larger star reaches a critical mass, it explodes. 1a supernovas are always the same mass when they explode, and have the same brightness. This makes it possible to estimate the distance to the star.

[8] The brightness of Cepheid variable stars increases predictably as the pulse-rate, or variability, increases. This makes it possible to estimate the distance to the star.

3.2 Stellar Voids

Stellar voids are created when two hollow universes collide. In a universe where no collisions have occurred, the stars ought to be created gradually, as the universe expands, and be distributed evenly throughout the universe.

When two hollow universes collide, the skins merge.

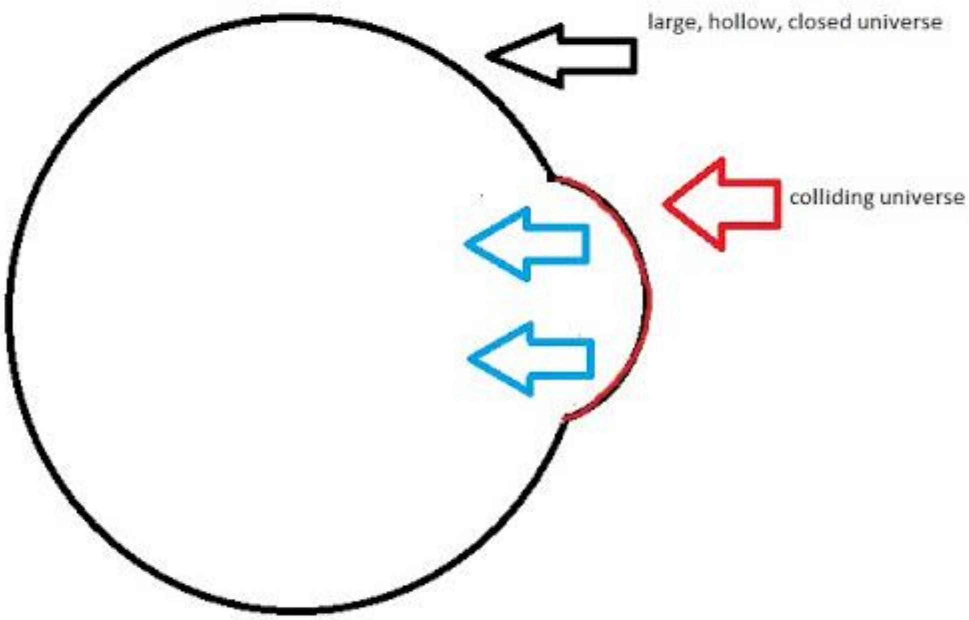


Figure 3.1.2-A: Colliding Universes

As the skins of the smaller [red skin] and larger [black skin] universes merge, the contents of the smaller universe [blue arrows] are forced into the larger universe. The ether particles, having little mass, blow into the larger universe first, creating a stellar void. The particles of matter, which have significant mass, and must be accelerated, enter the stellar void created by the ether particles, and create chains of galaxies. Hollow-universe collisions must have been common in the past. Most of today's universe is made of strings of galaxies surrounded by stellar voids, rather than evenly distributed stars.

3.3 Invariant Cosmic Background Temperature

A closed universe explains why the cosmic background temperature is constant in all directions. The universe started as a tiny object. Under constant bombardment, it developed local hotspots. The heat from the hotspots dissipated into the body of the universe, so the entire body had the same temperature. Even when large, new universes were incorporated into the universe, forming a string of new galaxies, the temperature difference between the new and old galaxies was dissipated in the skin of the universe, ensuring that no temperature difference appeared on the inner skin of the universe.

3.4 Vestiges of Creation

Throughout the visible universe, there are no vestiges of a Big Bang – no remnants of a huge explosion. That is because the matter of the universe was, and continues to be, created in the skin of the universe. Protomatter from the void enters the universe through its outer skin. The protomatter is converted to tetrahedral particles, trusses, ether particles, and other matter. The matter is ejected through the inner skin of the universe into the low-density bubble at the center of the universe. The creation process is continuous, not explosive, and takes place outside the visible universe.

Matter and Forces

4. Quarks and the Weak Force

While the decahedra were aggregating at the outer skin of the universe, under constant bombardment from protomatter particles, the vibrating trusses combined around decahedral particles to form quarks.

4.1 Quark Formation

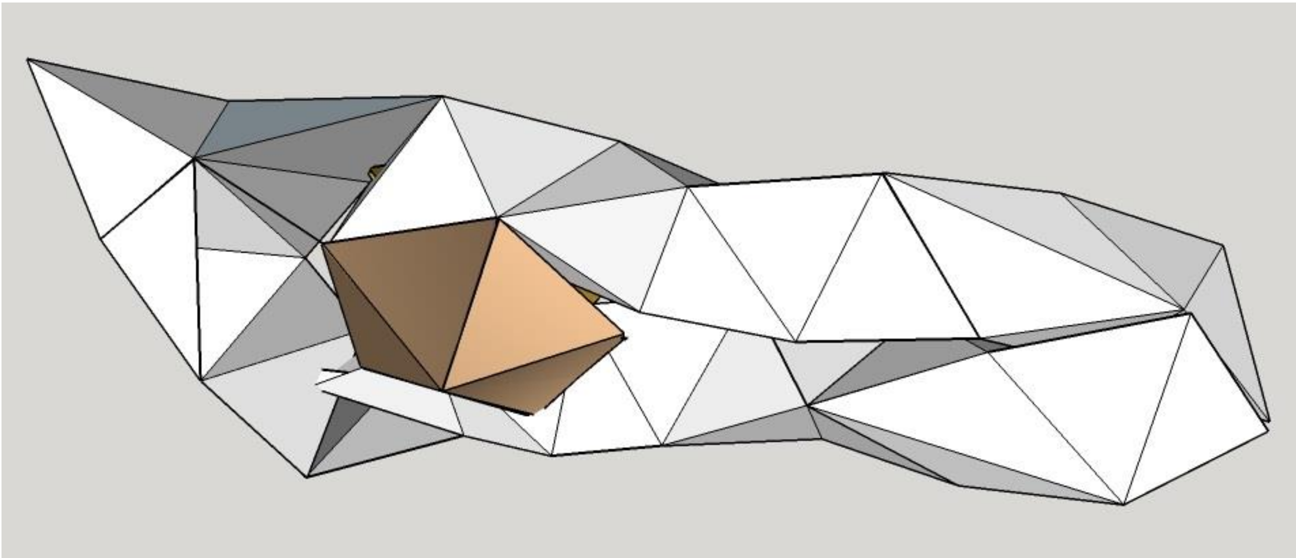


Figure 4.1-A: Quark

The sequence of events to construct a quark must have been:

1. A decahedral [ether] particle attached itself to a truss.
2. A second truss attached itself to the first truss, forming a vertex.
3. The second truss also attached itself to the decahedral particle, forming a nutcracker-like isosceles structure. A sulcus or crevice, containing the decahedral, ether particle, divided the sides of the triangle.
4. A second decahedral particle slotted into the sulcus on the underside of the nutcracker structure.
5. In the case of a down quark or an electron, a third truss added itself to the structure. Touching the decahedral particles, the third truss formed the base of the quark. The bases of down quarks and electrons were slightly shorter than the other two sides, creating “polar” quarks that had charge distributed unevenly. Charge is discussed in detail below.
6. Vibration and bombardment knocked off surplus truss material.

4.2 Weak Force

The weak force acts at the vertices of quarks to hold the quarks together. At the vertex of the quark a single-surface contact holds the trusses of the quark together. The ether particles in the sulcus of the quark create four-surface contacts, but the contacts are not all flat and strong. As a result, impact by a neutrino can be enough to destroy the weak bond and start the process of weak nuclear decay.

When quarks decay, they collapse. The quark trusses, ether particles, and strong force trusses surrounding the quark form a large debris cloud, the boson. The charge on the boson depends on whether the trusses in the decayed quark were mostly right- or left-handed. Left-handed trusses have negative charges. Right-handed trusses have positive charges. This is discussed in the Electron section [10], below. The boson takes its net charge from the two or three trusses in the quark. Bosons are short-lived. New particles quickly organize and emerge from the debris cloud.

5. Protons, Neutrons, and the Strong Force

As soon as they are formed, quarks combine to form protons, neutrons, anti-protons, and anti-neutrons. The quarks are held together by trusses which dock onto the sides of the quarks. The most likely structure for protons is illustrated in figure 5.1-A below. A crown structure is the most probable structure for a proton because the protons and neutrons fit together, in a later phase of creation, to form helium atoms.

5.1 Protons and the Strong Force

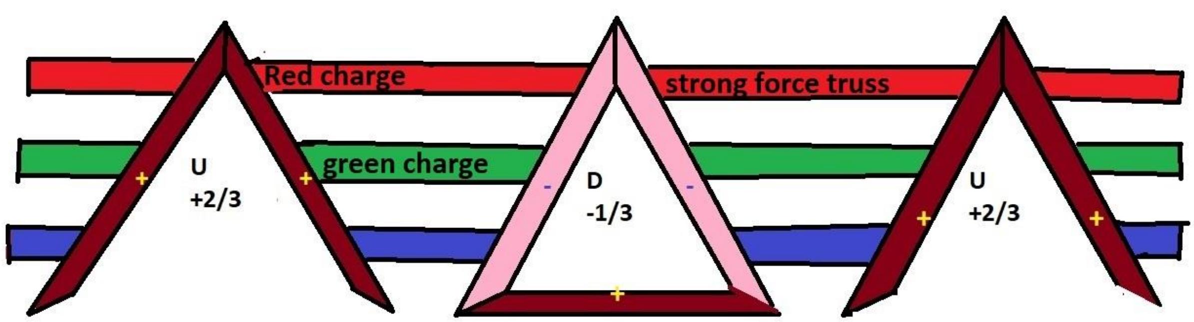


Figure 5.1-A: Possible Unfolded Schematic View of Proton

The figure shows three quarks joined by red, green, and blue gluon [strong force] trusses. Brown trusses are positive, right-handed, and clockwise. Pink trusses are negative, left-handed, and anti-clockwise. The Ether particles, holding the quarks together, on each side of the quarks, are not shown.

Notes on the proton and strong force:

- The isosceles shape of the Up [U] quarks, left and right in the figure, is maintained by their central ether particles. The central ether particles are shown in figure 4.1-A, but not in figure 5.1-A. The U-quarks have only two side trusses, and no base truss.
- The three quarks in the proton are connected by trusses, which form the red, green, and blue strong force bonds.
- The tetrahedral particles, from which the strong force trusses are formed, are like the links in a chain. They are strong when stressed in tension, but weak in compression.
- The tips of the red, green, and blue strong force trusses align with the surfaces of the tetrahedral particles which form the quark trusses.
- The charge on the quarks is calculated as follows: All the trusses in the quarks have a charge of one third of the charge of a proton or electron. The pink, or left-handed [anticlockwise] trusses, have a negative charge. The dark brown, or right-handed [clockwise] trusses, have a positive charge. The total charge on the quark is the sum of the negative charges on the left-handed trusses, and the positive charges on the right-handed trusses.
- The reason why the left-handed trusses must have negative charges, and the right-handed trusses must have positive charges, is discussed in the Electromagnetism section, below.
- The shape of a proton is crown-like. It has an uneven [polar] charge. The strong force trusses, in figure 5.1-A, join up to form the cone, as shown in figure 5.2-B.
- The red, blue, and green color charge bonds [gluons] which hold the quarks of the proton together are distinguished by their lengths.
- There are, in theory, 18 possible types of strong force bond [gluon]. The properties that distinguish the strong force bonds are: Length [red, green, or blue], Electrostatic charge [positive, right-handed,

clockwise, or negative, left-handed, anticlockwise], and Source and Target truss [+ to +, - to -, or + to -]. Only eight types of gluon have been distinguished experimentally. Some properties, such as “+ to –“, and “– to +”, are logically indistinguishable.

5.2 Neutrons

The neutron is structurally just like the proton. It is made of three quarks joined by strong force trusses. The difference between the proton and neutron lies in the quarks that compose it – two down quarks and an up quark in the neutron, two up quarks and a down quark in the proton.

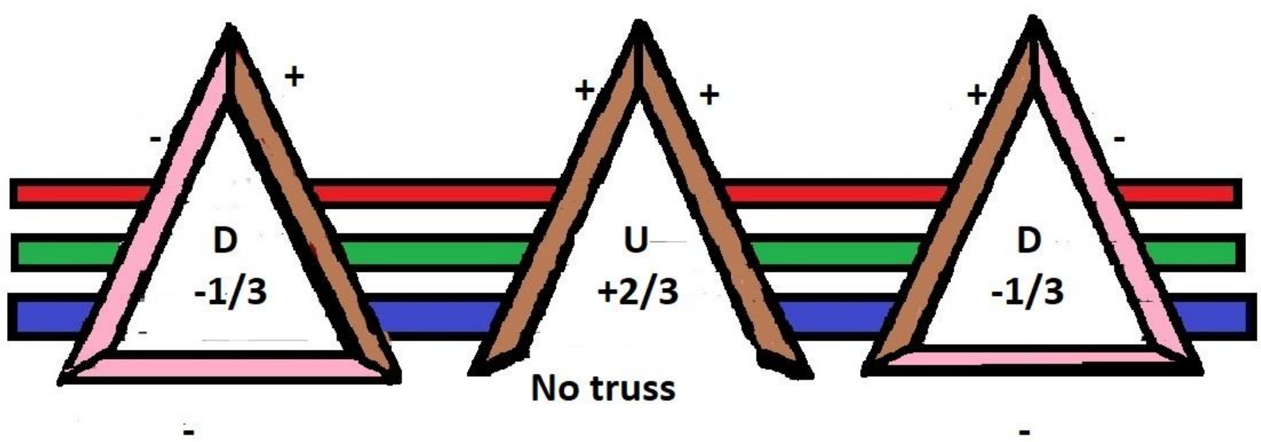


Figure 5.2-A: Unfolded Schematic View of Crown-Shaped Neutron

Like the proton, the neutron most likely has a crown shape, shown in Figure 5.2-B].

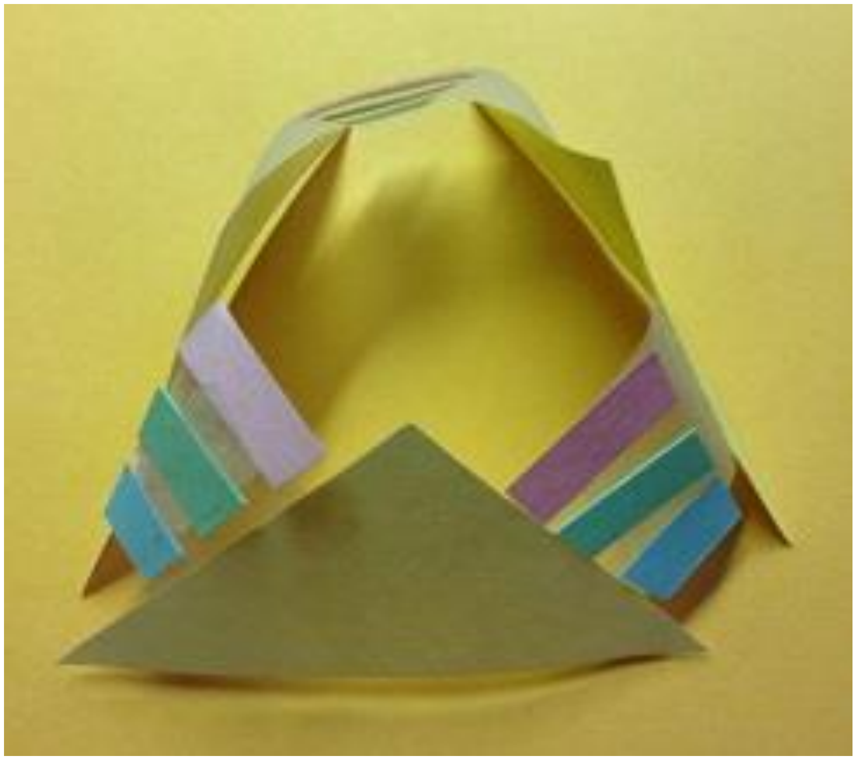


Figure 5.2-B: Crown-shaped neutron

The up quark contains one fewer truss than the down quarks. This partly explains why the neutron is slightly more massive than the proton. However, as explained in the “Mass” section below, the mass of a subatomic particle depends on its “cross section,” and “streamline profile,” rather than the number of trusses it contains. The truss missing in the up quark affects both the neutron's “cross section,” and “streamline profile,” and hence its mass.

6. Antimatter

Anti-protons and anti-neutrons are just like protons and neutrons but made with anti-up quarks and anti-down quarks. Anti-up and anti-down quarks are like regular up- and down-quarks, but with right-handed trusses substituted for left-handed trusses, and left-handed trusses substituted for right-handed trusses.

Anti-matter is almost never found in nature. The reason is that creating quarks, and then protons and neutrons is a complex, rare, low-yield process. However, quarks, protons, and neutrons are stable. Once they have formed, they act as templates to create more quarks, protons, and neutrons. The left-handed and right-handed trusses, abundant in the outer part of the skin of the universe, butt up against the quarks and protons. The quarks and protons accept truss-types that duplicate themselves. The crests of one truss fit into sulci of the other, assuring that both are right- or left-handed trusses. Finally, protomatter bombardment cuts the selected trusses to size. The process creates quarks [like the one in figure 4.1-A], and flat objects [like those in schematic figure 5.1-A], which fold into crown-shaped protons.

Because the template system allows the number of quarks and protons to grow rapidly and exponentially, the quarks and protons created by exponential duplication can move throughout, and populate, the skin of the universe. When quarks, protons, or neutrons encounter any form of anti-matter [anti-quark, anti-proton, or anti-neutron] they immediately react with it, forming mesons [right- and left-handed truss combinations] and releasing binding energy. All anti-matter, which could act as a template to create more anti-matter, is quickly destroyed. As a result, the type of matter [regular matter] which was created first in the universe becomes, and remains, dominant. Anti-matter can never become established.

7. Electrostatic Bonds

The nature of forces forms a critical distinction between Tetrahedron Conjecture and Standard Model universes. In Tetrahedron Conjecture universes, all forces between particles [except gravitational forces] are exerted by solid bonds.

- Weak force bonds form at the vertices of the quarks where tetrahedral particle trusses meet.
- Tetrahedral particle trusses between quarks form strong force bonds which hold protons and neutrons together.
- Decahedral, ether particle trusses form electrostatic and magnetic bonds.

In Standard Model Universes, forces are exerted by particles:

- bosons for the weak force,
- gluons for the strong force, and
- photons for the electromagnetic force.

In the Tetrahedron Conjecture, photons are unattached electrostatic bonds traveling through space. They carry radiant energy, but no force.

7.1 Attractive electrostatic bond

The electrostatic force is created by a string of interlocked ether particles. The strings emanate from every "docking port" on each truss. The exposed surfaces of every tetrahedral particle in a truss can act as a docking port for an electrostatic bond. The bonds extend out from the docking port. If the bonds encounter a docking port on another truss, or an unattached bond from another truss, they try to join the two trusses.

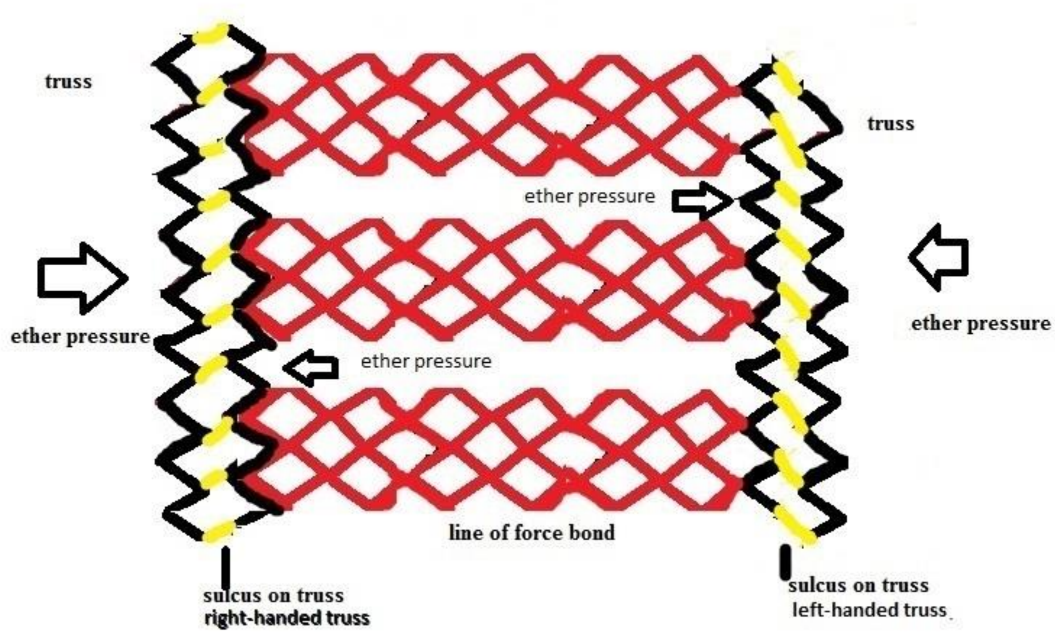


Figure 7.1-A: Attractive electrostatic bond

In figure 7.1-A, the left-handed truss on the left is being attracted by a right-handed truss on the right. Both trusses have black sides that look like the threads of bolts. The yellow sulci, between the crests of the thread, show the direction of the crests on the trusses. The trusses are joined by three Line of Force bonds [in red] of the electrostatic force bond. Lines of force are created when ether particles attach themselves to trusses [left], then create a tendril that seeks out a docking port on another truss [right], or another tendril from a different truss.

The Lines of Force are successfully docked with the truss on the left. Because the threads are crossed [left-handed on the left truss, and right-handed on the right truss], the Lines of Force are unable to dock with the right truss. The situation is like holding left- and right-threaded bolts together. Only the crests of the threads can touch. On the other hand, if two right-threaded or left-threaded bolts are held together, the thread crests can enter the sulci of each bolt. Same pitch threads held together create a more solid bond, with no vertical movement, than apposite pitches.

The lines of Force in figure 7.1-A abut, but they are not fully docked to the truss on the right. Because the Lines of Force are not fully docked, they are susceptible to erosion. Ether pressure from the far side of both trusses, away from the Lines of Force of the electrostatic bond, pushes the trusses together. Ether pressure on the near side of the trusses, where the Lines of Force are located, is partly blocked, or masked, by the lines of force. The force the ether particles can exert on the on the masked surface is lower than on the unmasked surface. As a result, there is an inward pressure on the trusses. Ether particle links in the lines of force are eroded and drop off, and the trusses move closer together.

The mechanism of an attractive weak bond is like sucking on a straw. Sucking [lowering the air pressure in the straw] makes it feel you are attracting the beverage. It is, however, atmospheric pressure pushing on the surface of the liquid outside the straw that forces the beverage up the straw and into your mouth. In the attractive electrostatic bond, masking and ether link erosion is the equivalent of reducing pressure by sucking on the straw.

7.2 Repulsive Electrostatic Bond

In figure 7.2-A, two right-handed trusses, with black sides, are being mutually repelled by three Lines of Force [in red] forming a repulsive electrostatic force bond. Because the Lines of Force are fully docked, they are stable and not susceptible to erosion. On the contrary, the Lines of Force can recruit additional ether links and push the trusses apart.

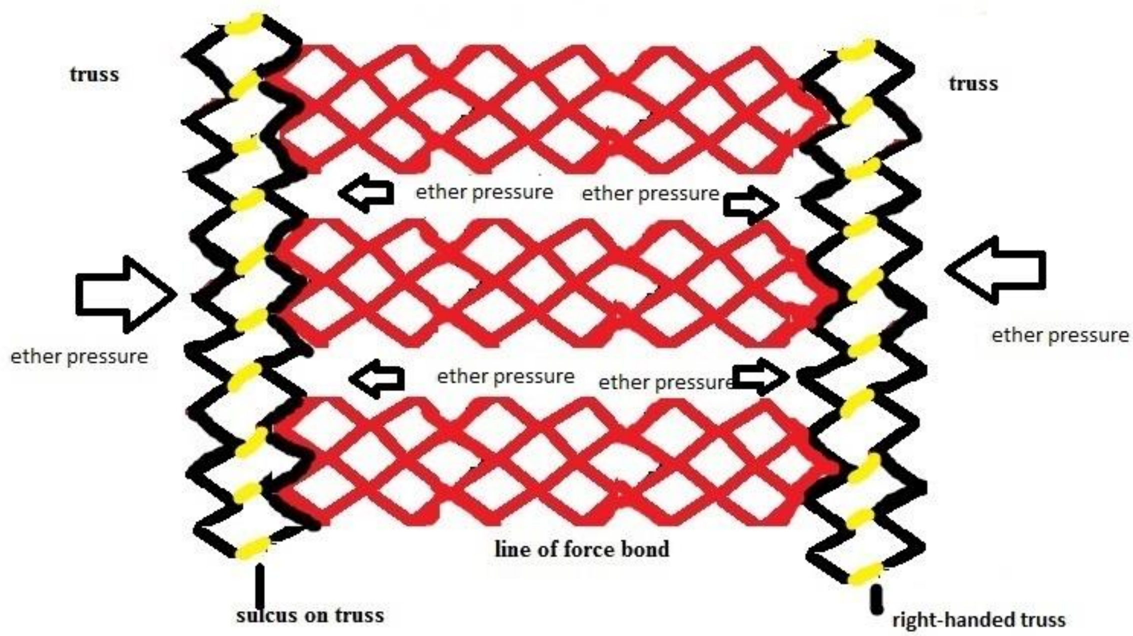


Figure 7.2-A: Repulsive electrostatic bond

As in the attractive electrostatic bond, the Lines of Force protect the trusses from ether pressure on the side of the trusses where the lines of force are located. There is, therefore, a difference in the total force exerted by the ether on each side of the trusses. Link recruitment by the Lines of Force is easily able to overcome the attractive force exerted by the ether and pushes the trusses apart.

7.3 Lines of Force of Electrostatic Bond

Figure 7.3-A shows an electrostatic bond attached to a truss. This is what is shown in the left side of figure 7.2-A.

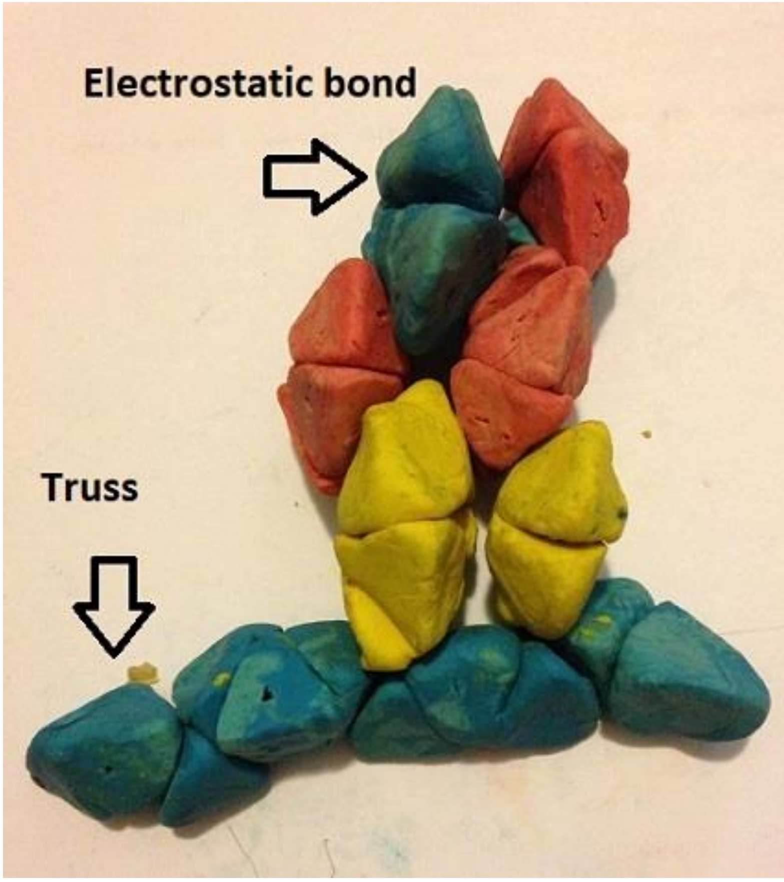


Figure 7.3-A: Electrostatic bond attached to a right-handed truss [solid blue]. Ether particles in the electrostatic bond are shown in different colors to make them easy to see.

An electrostatic bond consists of numerous Lines of Force, all along the truss. The lines of force create a ribbon along the truss. The Lines of Force dock along the truss in the joint of every fourth tetrahedral particle. A single line of force between two trusses, parallel or not, will always create a repulsive bond. A bond must consist of least two lines of force between parallel trusses to express an attractive or repulsive charge.

Because an electrostatic bond occupies four tetrahedra on a truss, it seems likely that the isosceles sides of a quark are ten tetrahedral units in length. Each isosceles truss bears two [4-unit] electrostatic bonds, plus one tetrahedron on either end to provide a weak bond to the adjoining truss. The base truss of the quark is six tetrahedral units in length. It supports one electrostatic bond, and two weak bonds. The different charges on the sides of the quark make the quark "polar." An electrostatic field will exert a greater force on the isosceles sides of the quark than on the base.

7.4 Electrostatic Bond ribbons on the truss of an electron

Figure 7.4-A, below, shows three electrostatic bonds [ribbons of Lines of Force] in cross-section, attached to the truss of an electron. The unassigned bond usually becomes briefly entangled with a nearby electron in another atom or molecule. Because lines of force are destroyed by stretching or twisting, entanglements with atoms at room temperature are normally short-lived. However, bonds within the atom are stable and static. The attractive bonds between the protons in the nucleus and the electrons, and the repulsive bonds between the electrons in the electron shells around the nucleus, are not affected by vibrations between molecules.

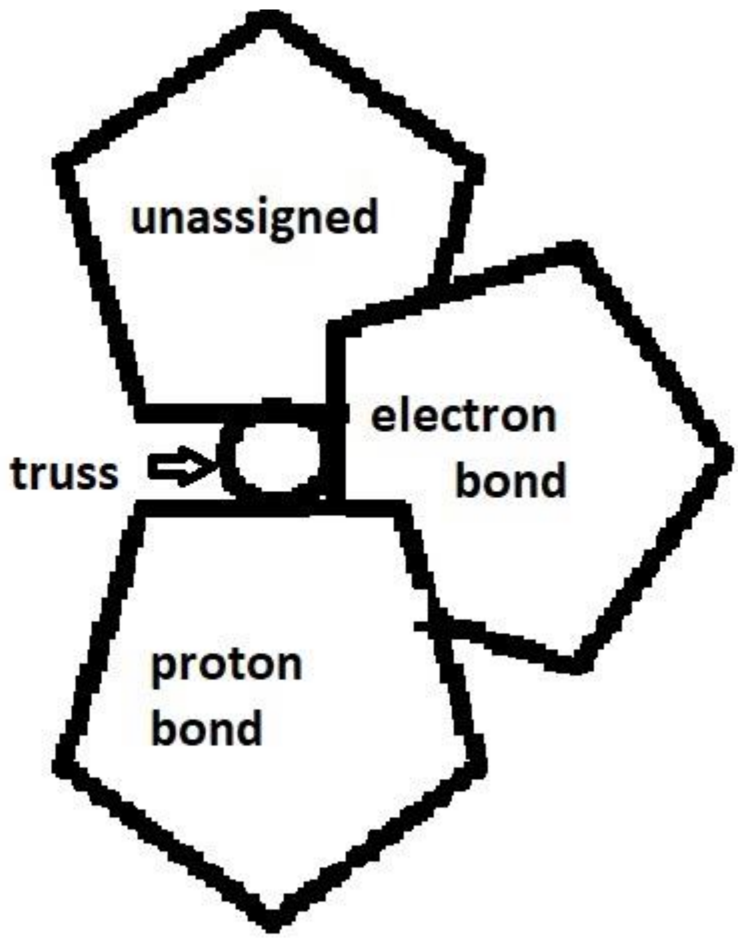


Figure 7.4-A: Side-view of electrostatic bond ribbons attached to truss of electron.

Solid electrostatic bonds, which form lines of force, must be unobstructed from source to target. Attractive and repulsive electrostatic forces, not centrifugal forces, keep electrons in their shells. Inner orbiting electrons in a planetary atom would cause instability in the outer electron shells of heavy elements whenever they disrupted a line of force to an outer electron.

Individual Lines of Force have the same strength throughout their lengths, from source to target. Entangled lines of force, between atoms, are thought, under favorable circumstances, to be able to remain entangled and maintain the same strength for huge distances. Electrostatic field-strength, however, does diminish with distance. Although the individual lines of force from an electrostatic source retain the same strength, they become spread out with increasing distance from the source. As a result, the electrostatic field-strength diminishes, even though the individual lines of force retain unchanging strength.

8. Structure of Nucleus, Helium Atom, and Hydrogen Molecule

Trusses and tetrahedral particles are denser than protomatter, and migrate to the densest part of the universe, by its outer skin. Quark-based matter [protons and neutrons] however, is less dense than protomatter. As a result, it floats away from the densest part of the universe [near the outer skin of the universe] towards the less dense center of the universe. Higgs particles transport decahedral particles to the inner skin of the universe. The electrons, protons, and neutrons, along with decahedral [ether] particles, congregate at the inner surface of the universe's skin. There they assemble themselves into hydrogen molecules and helium atoms, forming gas clouds. Eventually the gas clouds become sufficiently compressed by gravitation [ether bombardment pressure, discussed below] to become stars.

8.1 Neutron-Proton Pairs

Atoms have a central nucleus and surrounding electron shells. The nuclei of all atoms except hydrogen, are made of protons and neutrons. The structure of hydrogen is discussed below, in section 8.5. Although neutrons have no aggregate charge and, therefore, should not attract protons, they are polar. They are made of positive and negative trusses. The charged trusses in neutrons attract oppositely charged trusses in protons, as shown in figure 8.1-A below, forming neutron-proton pairs.

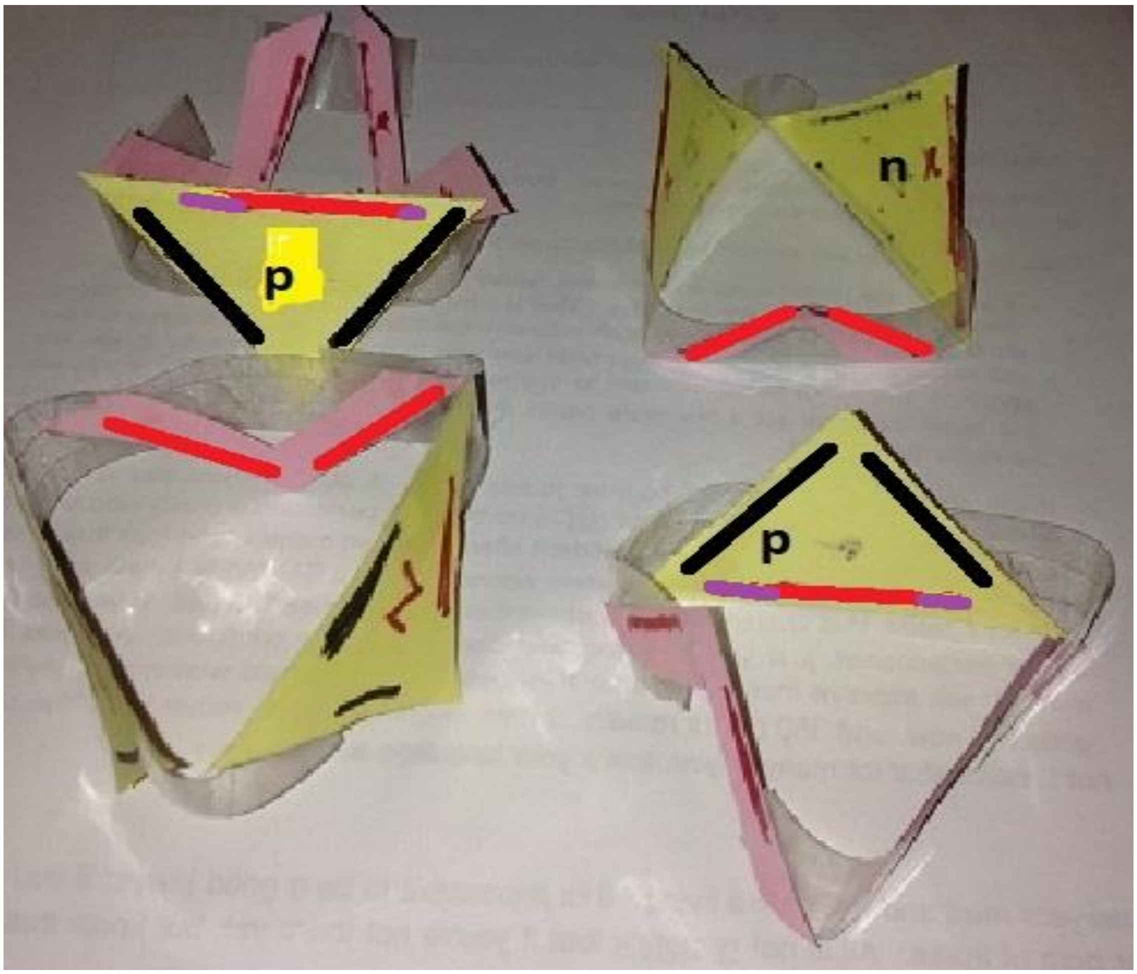


Figure 8.1-A: Detail of neutron-proton pairs

Yellow triangles represent down quarks. Pink triangles with cutouts represent up quarks.
Red lines represent positive, right-handed trusses. Black lines represent negative, left-handed trusses.
Positive and negative trusses are shown adjoining and providing an electrostatic bond between the protons and neutrons within the Helium nucleus.

Red lines represent positive, right-handed trusses. They become terminations for ribbon electrostatic bonds to electrons.

8.2 Helium Nucleus – a Self-assembling Ramrod

Two neutron-proton pairs connect at their pointed crowns to form a helium nucleus. The crowns are weakly attracted to each other by electrostatic forces. When they are close enough for the strong force trusses not to be destroyed by ether particle bombardment, they are “cemented” together by the strong force. Helium nuclei are self-assembling, even at low temperatures and pressures. Helium nuclei maintain a ramrod straightness. They are highly structured, not a blob of protons and neutrons.

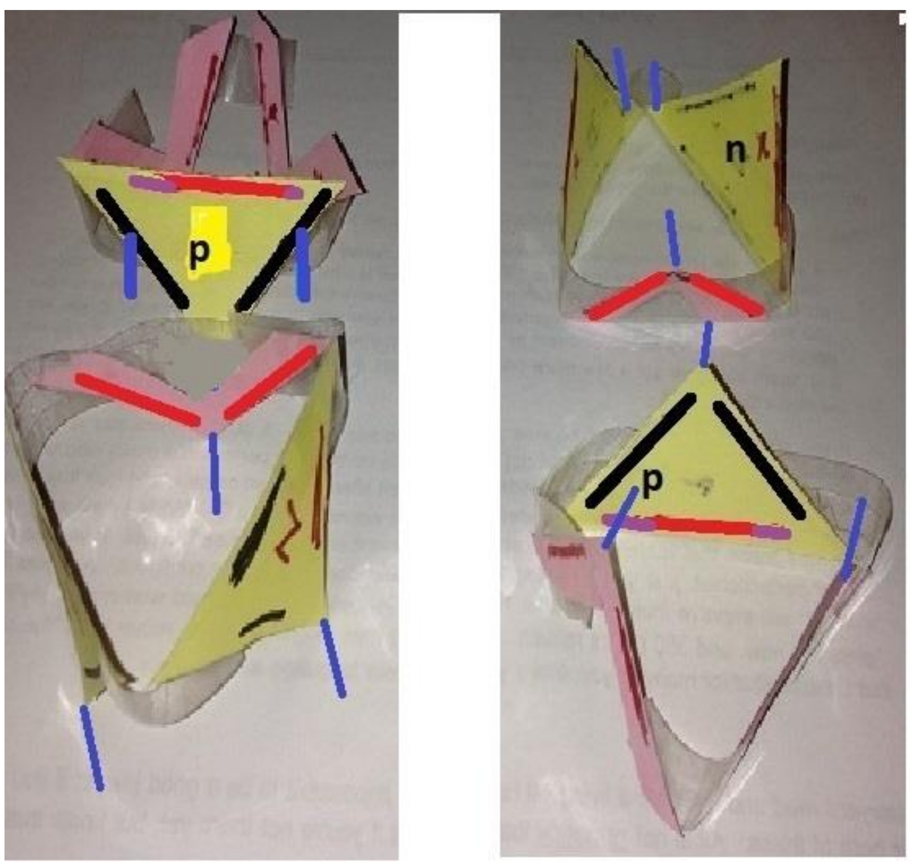


Figure 8.2-A: Detail of neutron-proton pairs in a helium nucleus - The neutron-proton pair on the left sits on top of the neutron-proton pair on the right. Blue lines show points of neutron and proton crowns where electrostatic forces attract the

neutron-proton pair. The trusses of the strong force, which are susceptible to destruction by ether particle bombardment if they are long, cement the quarks when they are close together. Yellow triangles represent down quarks. Pink triangles with cutouts represent up quarks. Red lines represent positive, right-handed trusses. Black lines represent negative, left-handed trusses.

8.3 Helium Atom

The strong force and electrostatic forces holding the helium nucleus together hold it straight, like a ramrod. The protons and neutrons have a fixed position within the nucleus. A fixed nucleus ensures unobstructed electrostatic bond access between protons and electrons.

Electrons are attracted to the positive charges in the helium nucleus, creating a helium atom, as shown in figure 8.3-A below. The forces on the electrons in a helium atom form a couple. The attractive proton bond holds the electron to the nucleus. Repulsion from the other electron in the atom keeps each electron in its shell. Figure 8.3-A, below, shows the forces acting on the electrons in a helium atom.

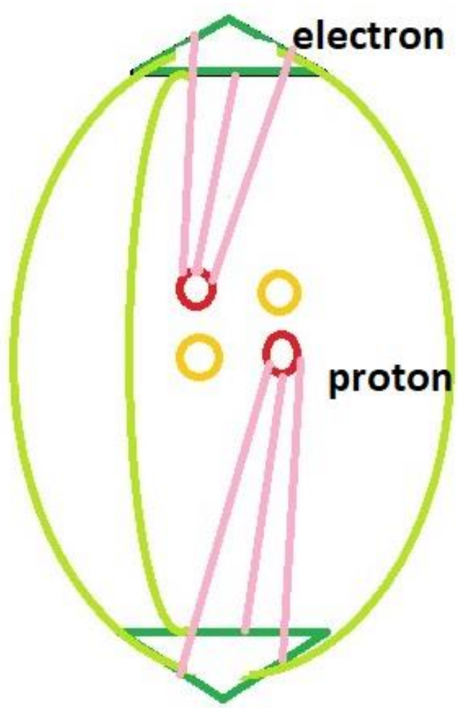


Figure 8.3-A: Helium Atom

Ribbon-like electrostatic bonds, in pink, attract each truss in the electron to the geometrically corresponding trusses in the proton. Ribbon-like bonds, in light green, repel each truss in the electron from the corresponding truss in the other electron.

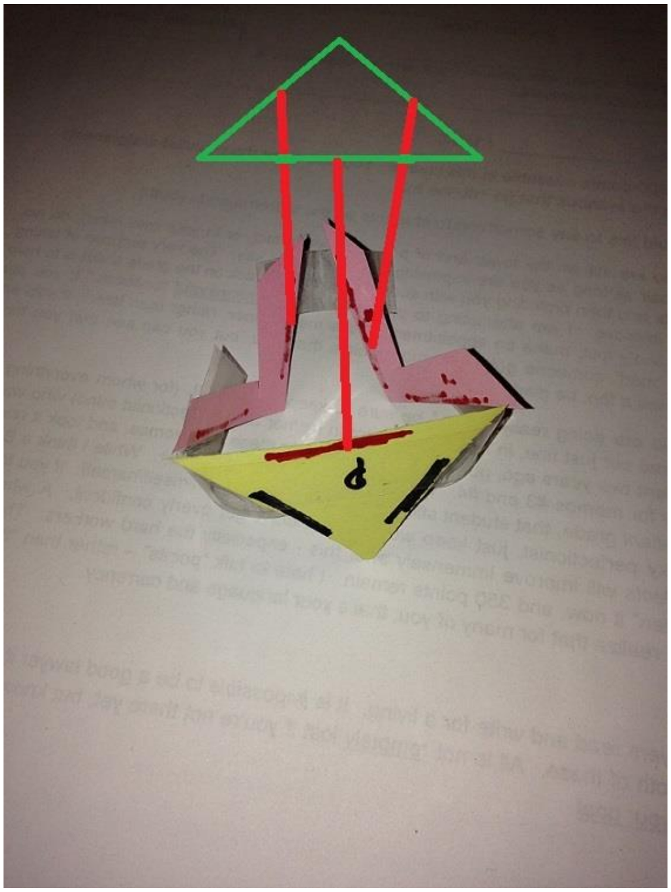
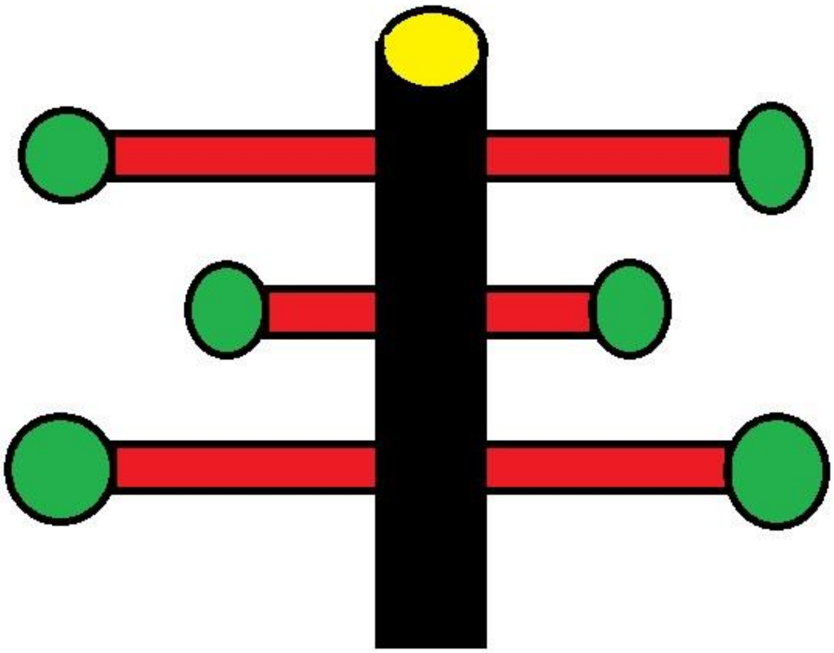


Figure 8.3-B Electron-Proton Bond

Orange electrostatic bonds join left-handed trusses within electron to right-handed trusses in the up- [pink] and down- [yellow] quarks making up the proton

8.4 Coat Stand atom

A nucleus is a ramrod of neutron-proton pairs. It is a fixed structure, not an amorphous blob of protons and neutrons. An atom is a three-dimensional coat stand. Electrons surround the central, extended, ramrod nucleus. The electrons remain in a static configuration, held in place by the repulsive forces from the other electrons, and the coat stand hook attraction of the nuclear protons.



8.4-A Coat Stand Atom
Ramrod nucleus is black /yellow in center. Orthogonal coat hooks [shorter hook moving away from reader] are red. Electrons [coats], attached to hooks [ribbon bonds] are green.

The electrons and nuclei in atoms move together. They rotate and travel for short distances, due to Brownian [thermal] motion or external electromagnetic fields. The electrons in an atom do not, however, move relative to each other, or relative to the nucleus. They are fixed in a matrix, held in place by a network of repulsive and attractive electrostatic forces.

Having a fixed matrix atom transforms quantum mechanics. It permits abandoning the solar system atom. It is replaced by the ramrod and coat stand. The coat stand atomic structure makes it possible to drop the planetary electrons, held in place by centrifugal forces. Relinquishing the planetary electron makes intrinsic electron spin unnecessary. There is no need to explain how electrons share an orbital. In a coat stand atom, electrons share shells, but they can never collide because the atom has a fixed matrix. The outcome of the Stern-Gerlach experiment is better explained by polar electrons [see section 4.1] being spun and accelerated as they pass through a magnetic field, than by intrinsic electron spin. The complex rules of quantum mechanics result from "classical" mechanical interactions between complex particles, that are made of many simpler particles.

8.5 Hydrogen Molecule

There are no hydrogen atoms [single protons with a planetary electron] in nature. Hydrogen gas is only found in molecular form, having two protons and two electrons, as shown in figure 8.4-A below. Electrons are held in place within the atom by electrostatic, not centrifugal, forces.

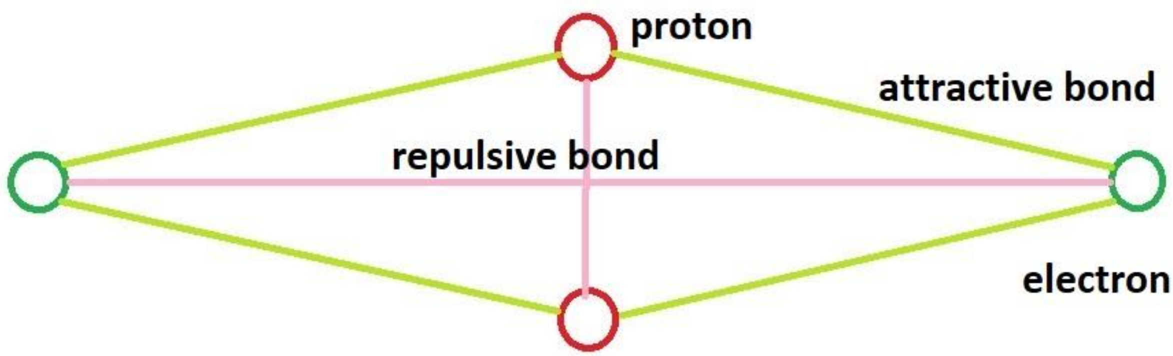


Figure 8.5-A: The Hydrogen Molecule

The first step in creating a hydrogen atom is creating a hydrogen ion. An electron enters a cloud of protons and forms electrostatic bonds to two of the protons in the cloud. Then a second electron is attracted to the ion, forming a hydrogen atom. Hydrogen atoms are self-assembling and can be created at low temperatures and pressures.

The diagram in figure 8.5-A shows the forces holding the hydrogen molecule together. Attractive electrostatic bonds [light green lines] join the electrons [dark green circles] to the protons [red circles]. Repulsive electrostatic bonds [light pink lines] between the protons and the electrons maintain the molecular structure and prevent the molecule from collapsing. Although hydrogen is important as fuel for main sequence stars, it is not [like helium] a building block for complex nuclei and atoms.

Hydrogen has two isotopes - deuterium, and tritium. The structures of the isotopes are shown in figures 8.5-B and 8.5-C.

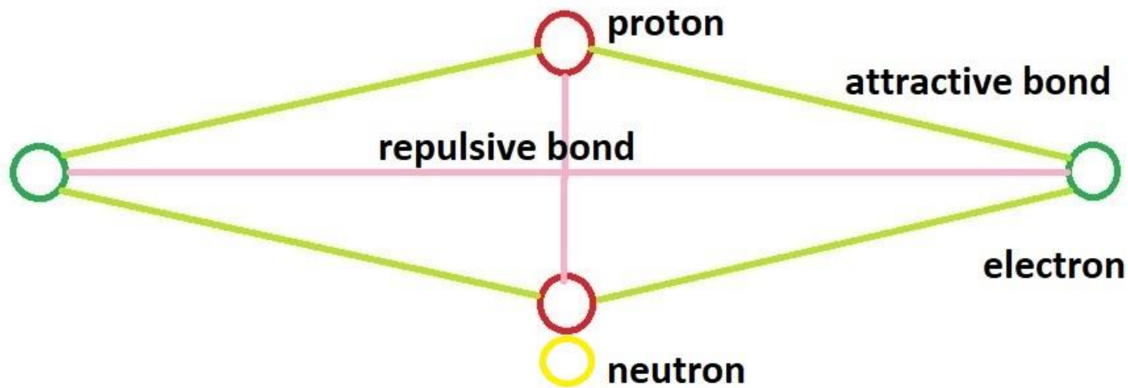


Figure 8.5-B: Deuterium molecule.
One proton is in a neutron-proton pair, discussed in the nuclear structure section below.

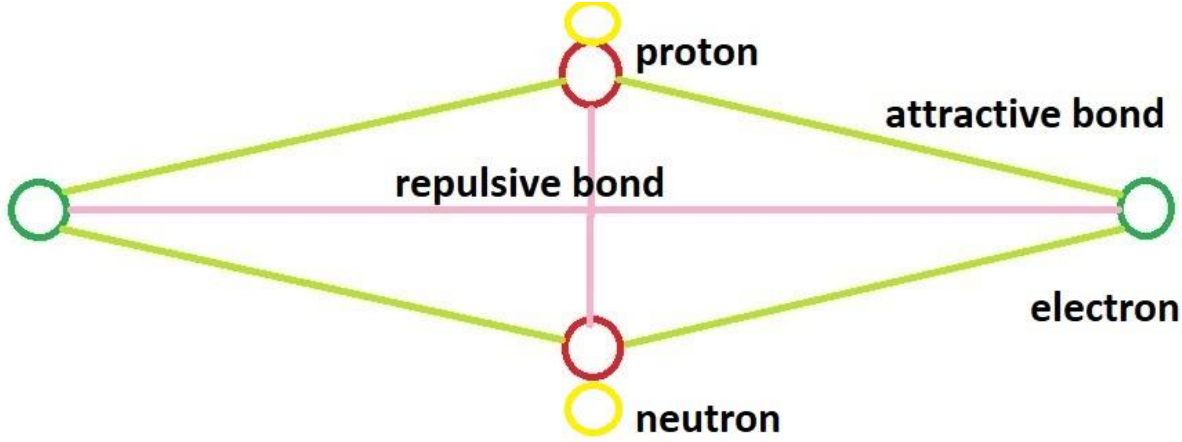


Figure 8.5-C: Tritium molecule.

The tritium molecule has the same empirical formula [two protons, two neutrons and two electrons] as the helium atom. However, its structure is very different from the helium structure shown in figure 8.3-A above.

9. Long-chain, “Heavy” Element Nuclei

Hydrogen molecules and helium atoms are self-assembling. Electrostatic forces alone enable them to assemble themselves, even at low temperatures and pressures. All other atoms are known as “metal” elements. It is a confusing name. The term metal element usually refers to conductive, reflective, ductile elements.

“Heavy” elements, having “long” nuclear chains [larger than just one helium nucleus] are synthesized in stars. Repulsive electrostatic forces on helium nuclei act to prevent helium nuclear building-blocks from joining to form the nuclei of heavy, long-chain elements. Helium building blocks, and neutron-proton pairs, must be squeezed close enough together so that the repulsive electrostatic forces keeping the neutron-proton pairs and helium nuclei apart are overcome. The short-range strong force, susceptible to destruction by bombarding ether particles at long range, can then hold the components of the nucleus together.

Heavy elements are created by adding building-blocks into the nuclear chain. The huge pressure required to squeeze neutron-proton pairs, neutrons, and helium nuclei together is found in the cores of stars. Heavy element nuclei are ejected into space in supernova or white dwarf star explosions, in binary or neutron star mergers, and in jets from black holes. Heavy element nuclei are also sometimes created, in tiny quantities, by cosmic ray spallation.

9.1 Long Chain Atoms

The neutron-proton pairs, neutrons, and helium nuclei are held together within the nucleus by strong force bonds but forced apart by electrostatic forces. The strong and electrostatic forces form a couple. The couple forces the nucleus to adopt a straight-line, ramrod, configuration which supports a static [non-planetary] atom. The protons in the nuclei of static atoms have direct, unobstructed, electrostatic lines of force to their electrons.

As the atomic nuclei cool after they have been expelled from their stars, electrons are attracted to them. An electron attaches to each proton with an attractive electrostatic bond. The electron then moves to minimize the repulsive forces acting on it. The electron balances the repulsive forces acting on it [from other electrons] with the attractive forces [from the protons in the nucleus], establishing its position in the electron cloud. The building blocks of the nucleus [the neutron-proton pairs and helium nuclei] turn readily towards their electrons. They are held together by strong force bonds which offer minimal resistance to torquing motion.

Each nuclear building block becomes orthogonal to its neighbor, reflecting the orthogonal positions of the electrons to which the protons are bonded.

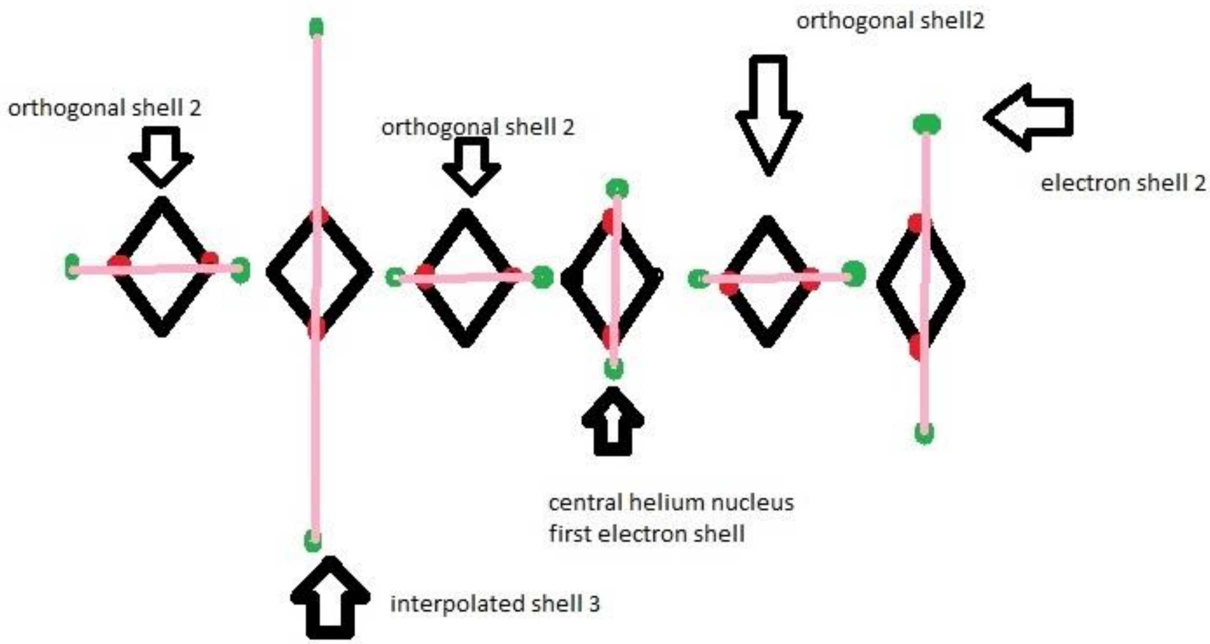


Figure 9.1-A: Schematic diagram of magnesium atom [12 protons]
Helium building blocks are shown in black. Protons are red dots. Electrons are green dots. Pink lines represent electron shells.

The central helium nucleus holds the first [smallest] electron shell. Two orthogonal helium building blocks surround each side of the central helium building block. They provide a second electron shell of eight electrons. The third electron shell is “interpolated” into the second shell. The “interpolated” helium building block increases the distance between the building blocks for the second shell electrons, reducing the mutual repulsion between electrons in the second shell. Transition elements are interpolated into the fourth period [electron shell] of the periodic table. As nuclear chain lengths increase further, the electrons of the lanthanide and actinide series of elements are interpolated, forming the outermost possible shells of electrons.

9.2 Fission

The nuclear chain remains stable even when it contains scores of helium building blocks. The orthogonal structure of the nuclear chain supported by spacer, isotopic neutrons, masks each helium building block from much of the repulsive force of the other building blocks. The electron cloud, on the other hand, depends on mutual repulsion between electrons to maintain the structure of the atom. As a result, some atomic isotopes are chronically unstable and liable to split into smaller atoms [fission] at any time. When atoms fission they emit helium ions [alpha rays], electrons [beta rays], binding energy photons [gamma rays] and, often, neutrons.

Neutrino bombardment of the nuclear chain is enough to split the nuclear chain if the isotope is sufficiently unstable. Neutrinos are created in vast numbers by the fusion reaction in sun. Neutrino bombardment seems to be a major cause of atomic fission. At perigee, when the earth is closest to the sun, fission occurs more frequently than at apogee, when the solar neutrino flux is at a minimum.

10. Electrons, Electric Current, Electromagnetism, and Cooper Pairs

Electrons have the structure of quarks. They are made of three left-handed, negative trusses. One of the trusses, the base truss, is slightly shorter than the other two, making electrons electrostatically polarized. Electrons do not interact with other quarks via the strong force or color charge. They never appear in nuclei so, together with positrons, they are called leptons rather than quarks.

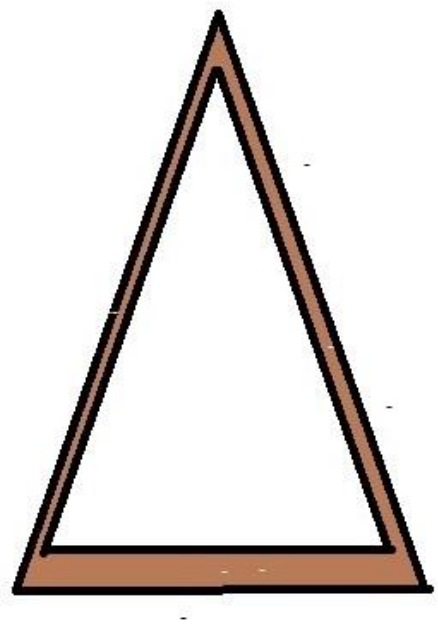


Figure 10-A Electron
The electron is made of three negative, left-handed, anticlockwise trusses. The total charge is -1. As with all quarks, the base of the particle is shorter than its isosceles sides, reflecting that the sulcus between the sides is created by an ether particle. The short base supports a shorter ribbon of electrostatic lines of force than the longer isosceles sides, resulting in the charge on the electron being polar.

10.1 Electric Current and Electromagnetism

The outer electrons of metals can escape from their atoms and move freely within their metallic crystals. When a voltage is applied to a wire, the electrons move along the wire, crossing crystal boundaries. Electrons repel each other, so they accumulate at grain boundaries inside their crystals. As they scrape along the boundary walls, they turn. The crests on the trusses of the free electrons rub on the vertices of the fixed electrons in the crystal wall. This causes the free electrons to rotate. Electrostatic bond lines of force form at every docking port on the electrons. As the electrons rotate, the lines of force turn with them. When the lines of force encounter a particle with which they can bond, they exert a force on the target particle. This force, resulting from the spinning electrons, is a magnetic force. Figure 10.1-A illustrates how an electromagnetic force is created.

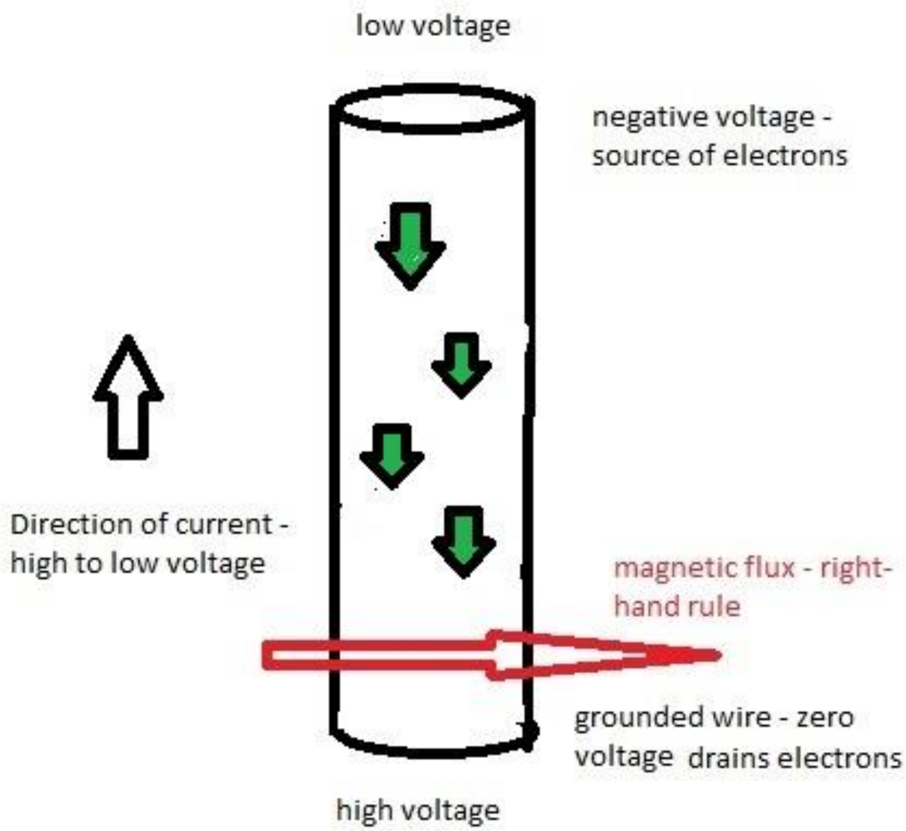


Figure 9-A: Electrons [green arrows] flowing down a wire.

Electrons [green arrows] flow from a negative voltage source to a less negative, zero, or positive drain. The electron-flow is opposite to the current-flow. The current flows from high to low voltage. The electrons flow from the negative source pole to the high voltage drain pole. As discussed in section 5 above ["Protons"], by convention a "negative" charge has been assigned to the left-handed trusses from which electrons are made.

The magnetic flux around the wire is always anticlockwise in the direction of the current. Hans Christian Ørsted[9] was first to report this discovery. He found the relationship between magnetism and electric current using a magnetic compass. André-Marie Ampère[10] formulated Ørsted's discovery into the right-hand rule, which predicts the direction of the magnetic flux around a wire carrying an electric current.

Ampère's right-hand rule results from the electrons turning anticlockwise as they travel down the wire. The trusses in the electrons must be left-handed. Vertices in the fixed electrons of the crystal grain boundary fit between the crests of the left-handed trusses of the electrons moving in the current. This causes the moving electrons to rotate anticlockwise.

Ferromagnetism, ferrimagnetism, antiferromagnetism, diamagnetism, and paramagnetism occur when electrons are forced to rotate within grains of a solid. Magnetism can even be created when electrons rotate within certain molecular configurations. The source of energy causing the electrons to rotate is normally molecular vibration [heat]. Permanent magnetism is caused by electron-rotation, just like electromagnetism.

10.2 Cooper Pairs

Although electrons do not interact with other nuclear particles through the strong force color charge, at temperatures near absolute zero they do interact with each other. They create chains of electrons [Cooper pairs] which superconduct. Cooper pairs are large enough to glide across grain boundaries in metals without shaking the grains. Shaking the crystal grains of a conductor creates heat, and electrical resistance. A schematic diagram of a Cooper pair is shown in figure 10.2-A below.

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[9] Örsted, Johannis Christianis (1820). "Experimenta circa effectum conflictus electrici in acum magneticam"
[10] Ampere, André-Marie (1822), "Recueil d'observations électro-dynamiques : contenant divers mémoires, notices, extraits de lettres ou d'ouvrages périodiques sur les sciences, relatifs a l'action mutuelle de deux courans électriques, à celle qui existe entre un courant électrique et un aimant ou le globe terrestre, et à celle de deux aimans l'un sur l'autre"

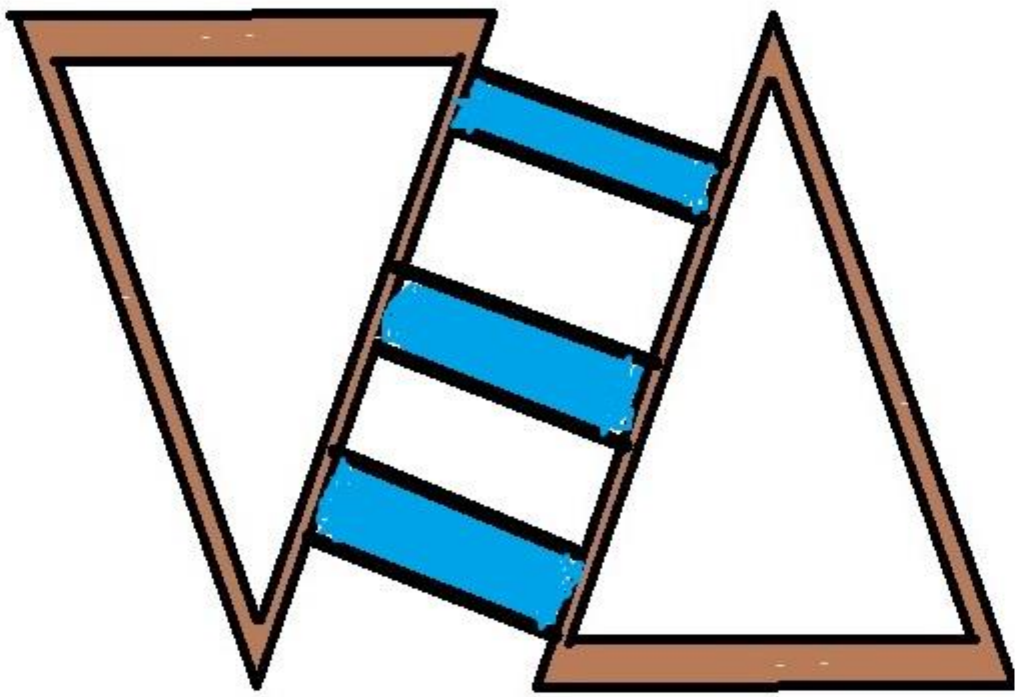

Figure 10.2-A Schematic diagram of Cooper Pair.
Two electrons are joined by the blue charge [shortest] strong force bond.
Strong force bonds are easily shattered by twisting or stretching vibrations from thermal motion.
Cooper "pairs" can be any length. Longer chains, at lower temperatures, conduct electricity better than short chains. If a single bond in a long chain is shattered, the remaining part of the chain may still superconduct.

Cooper pairs do not necessarily need temperatures close to absolute zero to form. They can be formed at room temperature and very high pressures[11], or at moderately low temperatures in "high temperature" superconductors. High Temperature Superconductors seem to contain narrow conductive filaments. The filaments constrain the movement of the electrons so they can form strong force bonds. It may prove possible to improve High Temperature Superconducting

[11] J. A. Camargo-Martinez 2019 "High-Tc superconductivity in H3S: Pressure effects on superconducting critical temperature and Cooper-Pairs Distribution Function" ArXiv

materials so they can superconduct at “Normal” temperature and pressure [N.T.P, room temperature = 20c, 1 bar].

Slightly offset layers of graphene [single layers of carbon atoms arranged in a hexagonal honeycomb lattice] seem to encourage Cooper Pairs to form. By following alternative routes through the conductor, the electrons avoid repelling each other. At a node point they are forced together to form “Cooper Trains” [lines of electrons connected by the strong force] that can cross crystal boundaries or material discontinuities without losing energy.

Ether

11. Photons

Photon packages are electrostatic bonds that have become detached from their sources and targets. They move through space, constantly reforming by losing ether particles on their trailing edges, and gaining ether particles on their leading edges, until they encounter a particle of matter that absorbs them. When they are absorbed by matter, they discharge their energy, lose their structure, and return to being regular ether particles in space.

The electrostatic bonds from the outer side of electrons [the side facing away from the nucleus] normally terminate by becoming entangled with the proton in an adjacent atom. These entanglements are short-lived. Electrostatic bonds are easily broken by shock [sudden increases in pressure which cause tension or compression in the bond] or twisting [turning past the point when the bond can be maintained. Shocks between warm, vibrating atoms are common. A truss and electrostatic bond are shown in figure 11-A below.

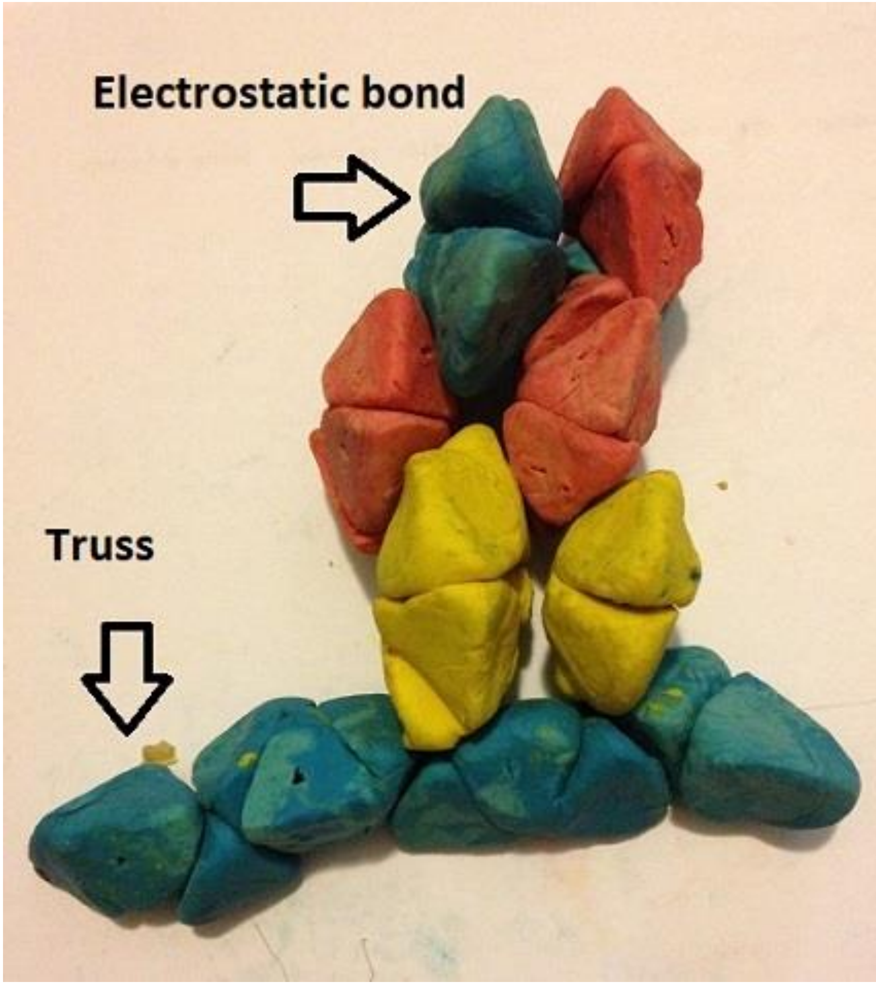

Figure 11-A: Electrostatic bond
The truss is made of tetrahedral particles. The electrostatic bond is made of ether particles. Although only two columns of ether particles are required to create an electrostatic bond, the entire truss is normally covered with ether particles which are seeking a terminating truss to form lines of force. Numerous lines of force create a ribbon-like electrostatic bond.

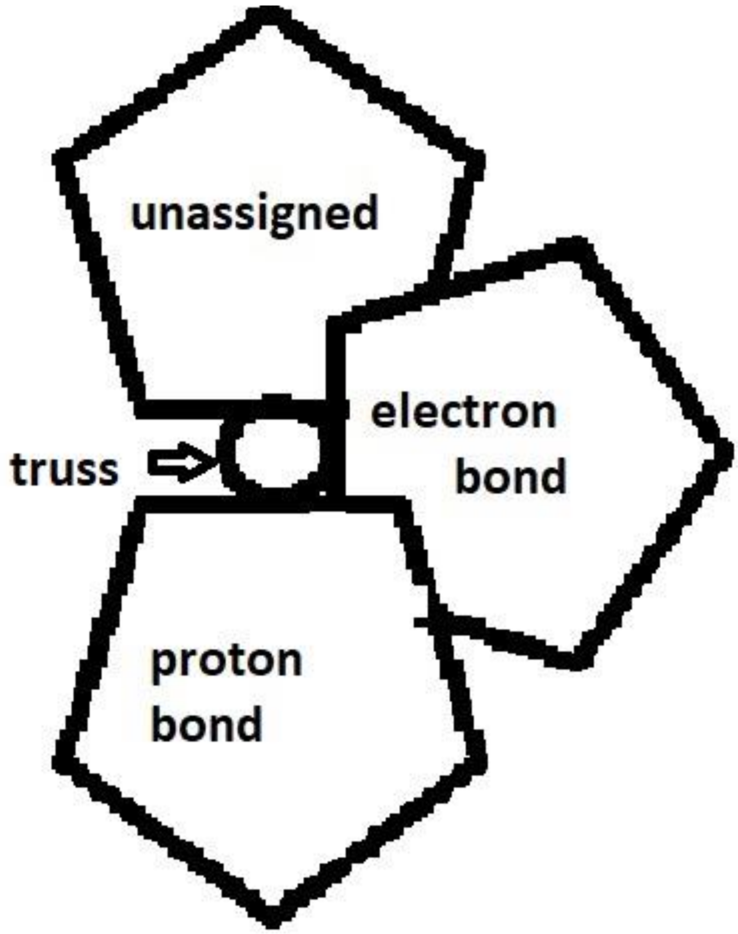

Figure 11-B: End view of truss.
The unassigned electrostatic bond usually terminates in entanglement with the proton of an adjoining atom. Lines of force within electrostatic bonds are normally attached right down the truss, forming a ribbon. When an electron is accelerated outward, it compresses the unassigned bond, creating a photon package.

When the ether particles within an atom are perturbed, the atom's electrons act like pistons. Max Planck[12], who was first to investigate quantization of black body radiation, described this as a “Cavity Effect.” Perturbation occurs when a photon is absorbed by the atom. The photon transfers its energy to the ether particles within the atom. The transfer creates a shock-wave which propels the atom's electrons outward, away from the nucleus, and compresses the unassigned electrostatic bond attached to the outer side of the electron. Perturbation within an atom also occurs

[12] Planck, Max (1901). "Ueber das Gesetz der Energieverteilung im Normalspektrum". Annalen der Physik. 309 (3): 553–563

when a nearby atom decays or disintegrates. “Shrapnel,” decomposed pieces of atom, enters the atom and perturbs it.

Eventually, the shock from the perturbation subsides. The energy from the perturbation is diluted as it spreads throughout, and outside, the atom. The electron reverses direction. Under guidance from its attracting proton within the nucleus, and its repelling electrons within its atom, it returns to its base, non-energized position within the atomic shell.

The unassigned electrostatic bond, detached from its source electron, travels into space on its own. The detached electrostatic bond, or photon package, is a longitudinal pressure-wave moving through space. Regardless of its speed when it left its source, it is jostled until it moves through space at the average speed of the other ether particles, the speed of light. It moves by accumulating ether particles on its forward end [the leading edge] and releasing them from its rear end [the trailing edge]. The attractive forces acting between the individual ether particles of the triangular photon package maintain its physical cohesion. The longitudinal pressure wave sustains integrity and direction, although the particles all around it, in space, are moving at random.

Individual ether particles remain within the photon package for their dwell time. When they are recruited by being hit by the photon-package, they are distorted, and they distort the ether particle in the leading edge of the photon-package. As time passes, more ether particles are recruited at the leading edge. Ether particles move from the leading edge of the photon package towards the trailing edge. At the trailing edge, the distortion of the ether particles has dissipated, and no pressure remains between the ether particles. Their dwell time has ended. The trailing ether particle drops off the organized photon package and returns to being part of the random ether.

The photon package is created by accelerating an electron, a triangular quark. This converts the ether particles which make up the attached electrostatic bond into a length of triangular pipe. The sides of the pipe are made of ribbons of compressed electrostatic bond. When the electron retreats to its non-excited location, the ether package continues traveling into space, recruiting and dropping ambient ether particles, perhaps for billions of years, until it encounters a particle of matter that absorbs it.

The photon pipes have the cross-section of the original electron. They can be polarized - the ribbons of compressed electrostatic bond can be forced into the same plane. This is often achieved in the laboratory by chopping off the sides of the pipe using a diffraction grating. In nature, light polarization commonly occurs when an incident triangular ray grazes a reflecting surface. The reflected light will be polarized into a plane as shown in figure 11.1-C. This often happens when light is shone through solutions of ‘optically active’ molecules or crystals.

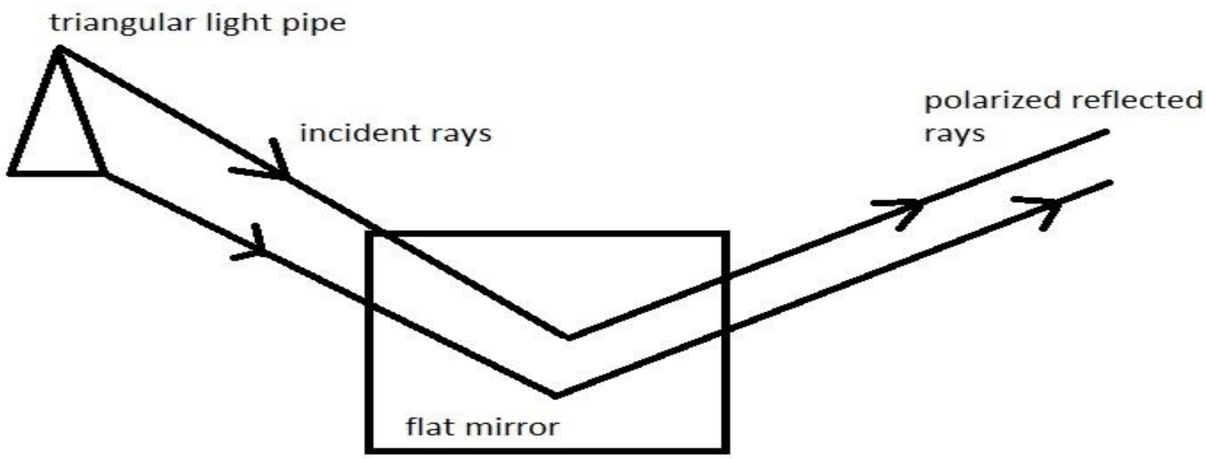

Figure 11-C: Ray diagram of triangular light pipe [photon] being polarized by mirror.

The photon package has a tiny mass – the mass of all the compressed ether particles it is made of. It is, therefore, also a particle. Although the photon’s mass is tiny, it is large enough to permit photons to exert detectable radiation pressure on a huge object like a solar sail.

Existence in the ether, and the ability to recruit and drop ether particles endlessly, permits the photon package to enjoy a dual nature. It is both a particle and a longitudinal wave of pressure energy at the same time. When the photon package is, eventually, absorbed by an atom of matter, it abruptly releases its compressional energy. The sudden increase in pressure causes the electrons in the atom to jump [exhibit "Electron Perturbation”], resulting in new photon packages being released. The energy in photons is never lost. Energy is always conserved.

11.1 Young's Slits

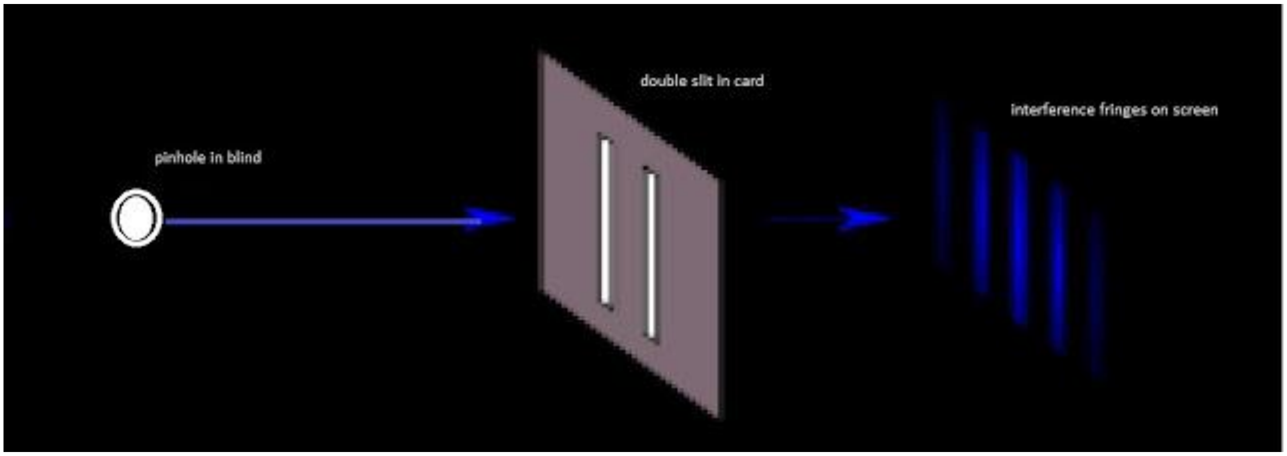

Figure 11.1-A: Young's Slit Experiment

In 1801, Thomas Young[13] performed his famous double slit experiment. Young shone light through parallel slits in a card between his pinhole source of light and a screen [see figure 11.1-A]. The light created fringes on the screen. The result seemed to support the theory that light was a transverse wave, an idea that had been earlier proposed by Christiaan Huygens[14]. The waves were diffracted by the slits and interfered to create the fringes. The experiment cast doubt on the view that light was a longitudinal pressure wave. Newton's Corpuscular Theory of light, which was the current theory of light propagation at the time, did not predict fringes. Both Newton's and Young's theories of light saw photons as single particles, not extended, complex, multipart structures.

11.1.1 Corpuscular Explanation of Young's Slit Experiment

An alternative explanation of Young's experiment is that photon packages are made of numerous ether particles. Ether particles passing close to the sides of one of the slits are attracted to the matter in the sides of the slit as they pass through it. They are diffracted. They hit the screen a distance away from the center of the light ray.

[13] Young, Thomas (1804) "Experiments and Calculations Relative to Physical Optics"
[14] Christiaan Huygens (1690) "Traité de la Lumière[" Académie des sciences, Paris

Ether particles from the second slit are likewise diffracted. When they hit the screen in the same place, and at the same time, as the ether particles from the first slit, they interfere constructively. They perturb the electrons in the paint of the screen and force the paint to shine, creating a bright fringe.

Slightly to the side of each bright, constructive interference fringe, the ether particles arrive at different times. The distances the ether particles travel from the slits determine their flight-times. The difference in arrival-time prevents the ether particles from providing enough energy to perturb the electrons on the surface of the screen. A dark area results where no constructive interference occurs.

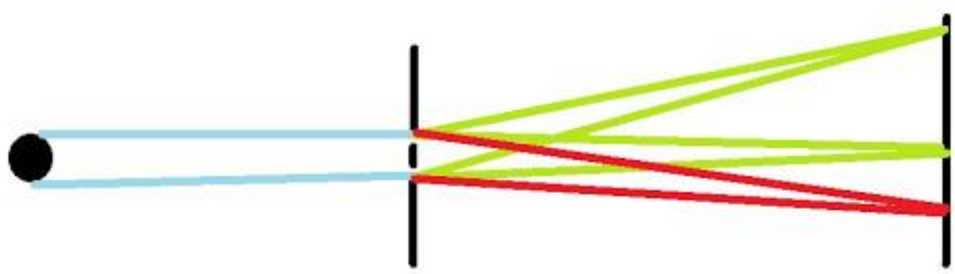

Figure 11.1.1-A: Ray Diagram of Young's double-slit experiment

In Figure 11.1.1-A rays from the sun [shown in blue] pass through the pinhole, then through the double-slit where they are diffracted. After diffraction, the ether particles in the green rays, whose length is an integral number of light wavelengths, arrive simultaneously at the screen, interfere constructively, and illuminate the screen. Ether particles in red rays, whose lengths are a non-integral number of light wavelengths, arrive out of phase at the screen and do not, individually, have the energy to illuminate the screen.

11.2 Photons, wavelength, the Young's Slit Anomaly, and Diffraction

Figure 11.2-A is a schematic diagram of the truss of an electron carrying an attached electrostatic bond. The electrostatic bond will become a photon when the electron is accelerated outward. The truss carries a full row of photons, all attached together. The three trusses forming the electron will create a triangular photon package. The columns of ether particles are individual photons. The columns of ether particles packed back-to-back along the electron truss form a ribbon of photons. The number of ether particles stacked in each photon column determines the wavelength of the photon. The wavelength is quantized. It is the length of an integral number of ether particles.

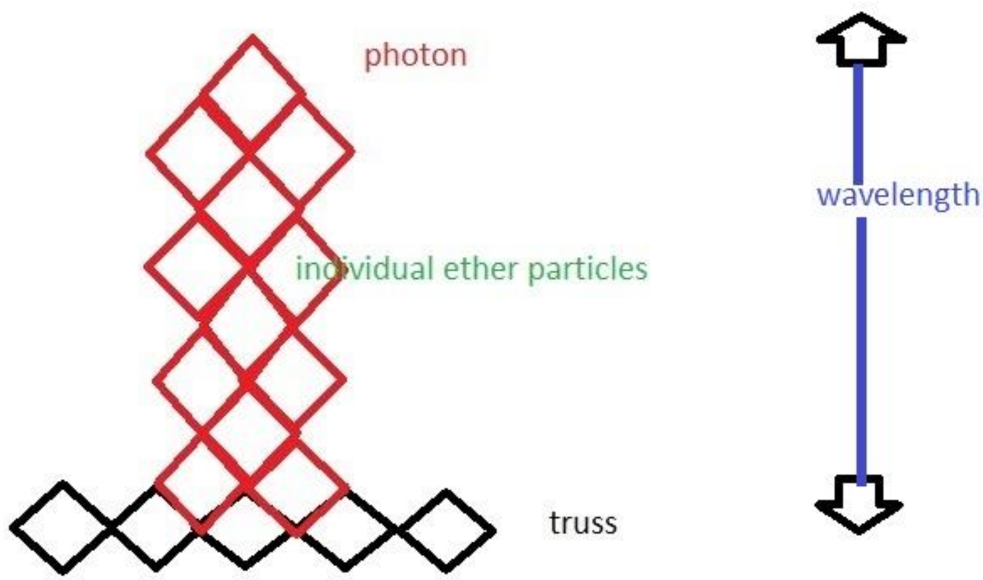

Figure 11.2-A: Schematic Diagram of Photon attached to truss

The photon is the smallest possible unit of light. However, light is always emitted from electrons in packages containing many photons. This explains the Young's Slit Anomaly. When *individual* light packages [in a very dim light] pass through a double slit, they create fringes. When they pass through a single slit they behave like particles, creating a single bright spot, but no fringes. The double slits divide the light packages into two streams of photons which can interfere constructively.

The length of the photon in Figure 11.2-A is the wavelength of the light. The wavelength is determined by the push-time of the electron as it accelerates its electrostatic bond after its atom has been perturbed. Each electron has a fixed distance, the quantum jump, it can move whilst accelerating the electrostatic bond. The quantum jump distance is determined by the type of atom and the electron-shell in which the electron is embedded. Each electron within an atom accepts several discrete energies of push. Gentle pushes create long low-energy photons. The ether particles in these photons are only slightly distorted, so they have low internal energies, and long dwell times before they push away from the electron truss. Violent perturbations result in short push-times, high internal energies, short dwell times, short wavelengths, and high frequencies.

11.3 Speed of Light

The speed of photons in ether [the speed of light] and the speed of sound in the atmosphere are comparable:

- The speed of light is not affected by the speed of the matter that emitted it. The speed of light is entirely determined by the speed of the ether particles through which the photons travel.

If the speed of matter approaches the speed of light, a shockwave is created in the ether which dissipates energy and slows down the matter. The blue glow of Cherenkov[15] radiation, created when fission-product particles hit water, is an example of a shockwave dissipating energy. Used reactor fuel rods are often stored in cooling ponds. Light propagates in water at about seventy-five percent of its speed in open space. The fission-products [electrons, neutrons, or protons] emitted by the fuel rods compress the ether particles in the water - much as they do when electrons perform a quantum jump within an atom. The result is the pretty, blue glow of Cherenkov radiation.

If a body approaches the speed of sound in the atmosphere, a shockwave, or sonic boom, is generated. The sonic boom is the acoustic equivalent of Cherenkov radiation.

- The speed of light always appears invariant to an observer. Although the speed of light declines as the light photons approach matter, distances

[15] Cherenkov, Pavel 1934 "Visible emission of clean liquids by action of ? radiation"

> shrink, and time dilates to compensate. A local observer always sees the same speed of light. Invariance is the result of ether pressure [the pressure on the ether exerted by the inner skin of the universe] remaining constant throughout the universe. Areas of high ether pressure, created when stellar bodies merge, are quickly dissipated as gravitational waves.

A hotspot in an oven is the gaseous equivalent of merged stellar bodies. It is quickly dissipated by diffusion throughout a body of even temperature [molecular speed].

12. Mass, Gravitation and Dark Matter

Mass, gravitation, and dark matter are all effects of ether particles.

12.1 Mass in matter

When matter particles are stationary, or not accelerating, the ether particles surrounding them are in equilibrium. This is much the same situation as for objects sitting in a windless, gaseous atmosphere. However, when the matter particles start to accelerate, ether dwell times and ether pressure on the forward side of the particles increases, while dwell times and ether pressure on the rearward side decrease. Accelerating particles of matter exhibit mass because the surrounding ether particles exert uneven ether pressure on the forward and rearward surfaces of the particles. This differential pressure resists particle acceleration.

In addition to the number of trusses in a particle, a second factor influences particle acceleration. It is, "Streamline Profile." Streamlined particles pass through ether much more smoothly than particles whose shape obstructs the flow of ether particles. The acceleration of a particle depends on both the number of trusses in the particle and on the organization of the trusses [the particle's streamline profile]. The effect of structure on mass explains why it is difficult to predict the mass of a particle, even when the quantity of matter [the number of trusses] in the particle is known.

12.2 Gravitation

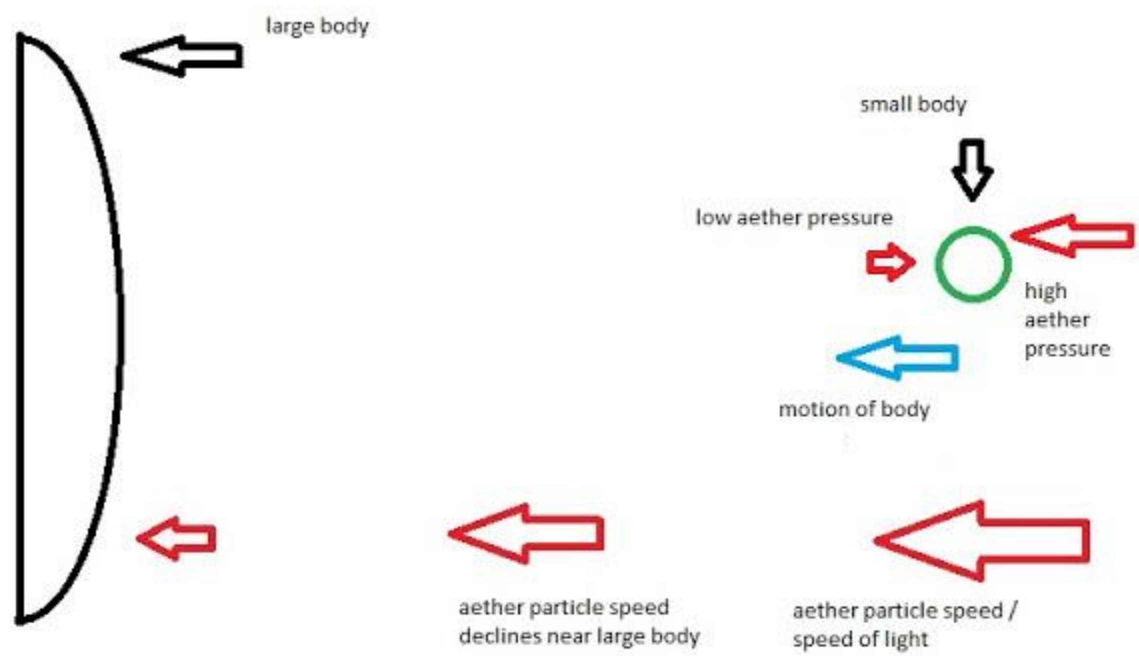

Figure 12.2.1: Gravitation

When matter particles approach a body of truss-based matter, they accelerate toward the body because of gravitation. Although ether particle dwell times remain unchanged within and around bodies of matter, each ether particle contact cumulatively slows the ether particles. The average speed of the ether particles [the speed of light] declines as distance from a center of mass reduces. There is a gradient of ether particle speeds acting on a mass as it approaches another center of mass. This gradient of speed is the acceleration due to gravity.

12.3 Dark Matter

When ether particles encounter each other, they deform elastically, and remain in contact for their dwell time. The ether particles impede each other's motion, creating ether particle mass and gravitation. Ether particle gravitation is the source of Dark Matter.

Dark matter accounts for the structure of galaxies. The visible stars in galaxies have far too little mass and gravitation to produce the observed galactic structures. The inner stars in galaxies are held together by the huge gravitation from invisible, central black holes, as well as Dark Matter. The outer stars are held in their structures by Dark Matter, the gravitational attraction of the ether particles which fly freely throughout the balloon universe and prevent it from collapsing.

12.4 Dark Energy

Looking far back in time towards the edge of the universe, light undergoes a huge spectral redshift. Starlight is moved to the far infrared end of the spectrum, as if the source of the light, the star, was receding rapidly. The infrared shift is greater for more distant stars. It suggests that expansion of the universe is accelerating with distance.

Under the Tetrahedron Conjecture, there are three sources of the spectral redshift:

1] The universe is expanding steadily. The process of Constant Creation continues to convert protomatter from the void into matter and ether particles within the skin of the universe. The product of Constant Creation is eventually ejected from the inner skin of the universe into the low-density interior of the balloon universe.

2] Balloon expansion is accelerating as the outside area of the universe grows. The expanding outside skin of the universe permits the rate at which protomatter is absorbed into the skin of the universe to increase.

3] Gravitation from the skin of our balloon universe reduces the speed of light. That increases redshift, giving an illusion that the universe is expanding more rapidly than it really is.

13. Space and Time

The fundamental unit of distance is the mean distance between ether particles. Distances contract when ether particles are compressed by matter traveling at high speed, or by gravitation, yielding Lorenz distance contractions.

The fundamental unit of time is the mean period between ether particle interactions. The first step in physical and chemical reactions is an interaction between ether particles, creating a weak bond between subatomic particles. If bond creation is slowed, all other processes are slowed. Atomic spectra move to longer wavelengths and chemical reactions, which cause growth and aging, are also slowed.

These two units, of distance and of time, are related by the speed of light, the average speed at which ether particles move through space. The mean free path between ether particles is short, so all ether particles in a local area move at much the same pace.

The relationship between distance and time ensures that the speed of light is invariant. If the mean distance between ether particles is reduced, the period between ether particle interactions then increases, ensuring that the local speed of light remains the same. This is consequence of ether pressure being constant throughout the universe.

The passage of time can be seen to slow when light is emitted from within a gravitational field. Light spectra are shifted towards lower frequencies as gravitation increases. The passage of time slows as gravitation increases because the speed of the ether particles slows in a gravitational gradient. In a gravitational field, the mean distance between ether particles diminishes and the frequency of ether particle interactions drops. At the event horizon, distances shrink to zero as the space between ether particles reduces to nothing. Ether motion, ether particle interaction, and time, stop. Acceleration of masses becomes impossible.

Motion reduces the distance between ether particles. At low speeds, the effect is negligible. At high speeds, close to the speed of light it looks, to an outside observer, as if the speed of light has slowed. To a local observer, the speed of light remains unchanged. To an outside observer, the effect of speed is the same as entering a gravitational field. Distances shrink, time slows, mass increases.

Standard Model explained by Tetrahedron Conjecture

14. Standard Model

When tetrahedral particles are converted to trusses, ether particles, and quarks in the outer skin of the universe, they undergo an irreversible change. They are fused together. It is much like firing a clay pot. Once the pot has been fired, hitting it will only create potshards, not clay. To recover the original clay a totally different, chemical procedure is required. Similarly, shooting sub-atomic particles at each other yields only sprays of baryons, photons, and neutrinos. It provides no insight into the composition of the “shards” of sub-atomic particles.

Because the process of creating trusses and ether particles is non-transitive, it is not possible to extract protomatter or trusses from matter. There is no deterministic method for finding the original composition of sub-atomic particles. Instead, the only possibility is to use the “guess and test” technique: to guess the fundamental structure of the particles, then test to see if the products built from those raw materials have the properties of particles found in nature.

Years of research sifting through the nuclear debris created by particle accelerators and colliders made it possible to identify seventeen particles [shards] that account for everything in the universe. The seventeen particles are summarized in the Standard Model, below:

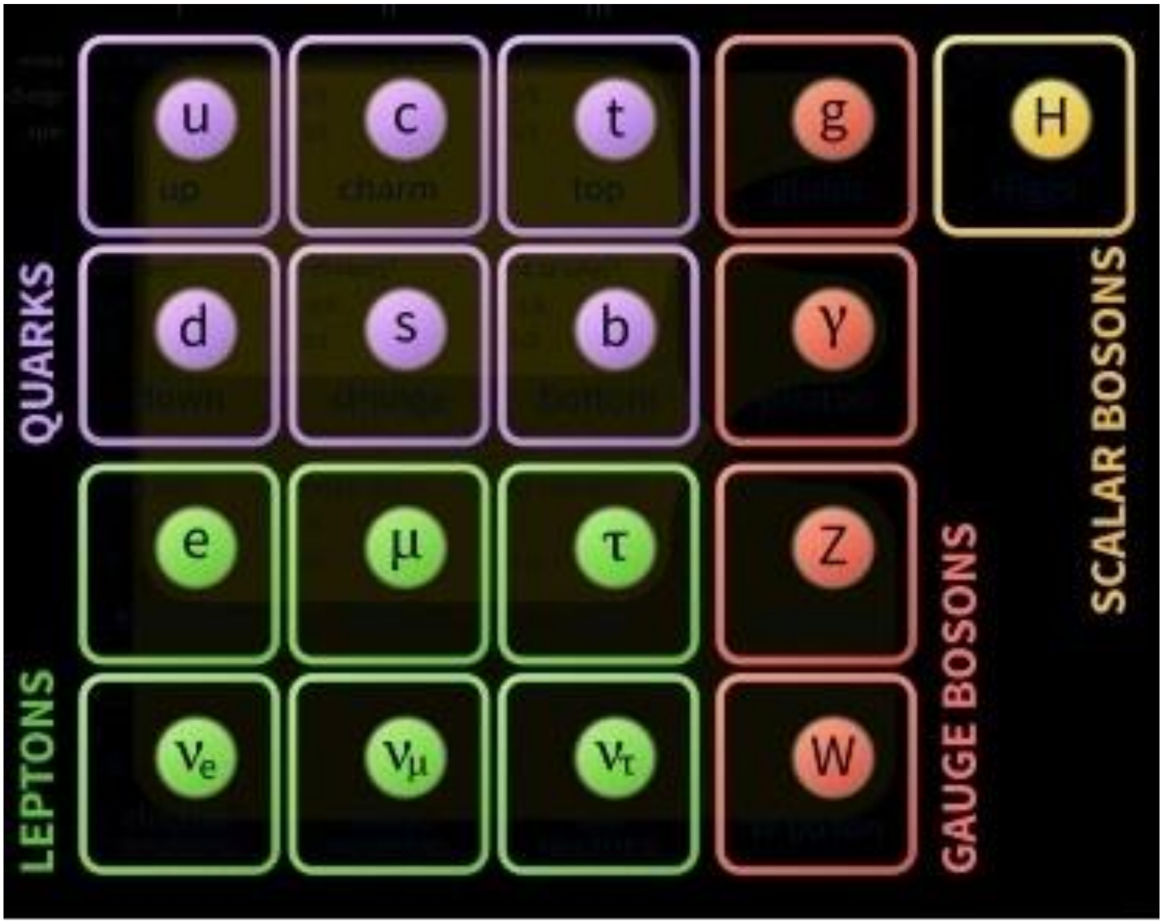

Figure 14-A: Standard Model - The Standard Model shows the fundamental particles that are believed to make up the universe.

To be accepted, the Tetrahedron Conjecture must be reconciled with the Standard Model. All the particles shown in the Standard Model must be explained by the Tetrahedron Conjecture.

14.1 Baryons and Leptons

On the left of the Standard Model Diagram, are the Up [u] and Down [d] quarks. The electron [e], is called a lepton in the Standard Model, because it is not part of the nucleus. At high temperatures and pressures each of these particles becomes a more massive particle that has the same charge as the original particle, creating families of particles. In these particle families, truss vanes have been added to the smallest members of the families. The vanes are made up of right- and left-handed trusses. The charges on the trusses in the vanes offset, ensuring that the original particles' charges are not altered. However, the streamline profile is augmented, increasing the particle masses.

14.2 Electron, Muon, and Tau Family

The muon is the middle-mass particle in the electron family. It is more massive than the electron, and less massive than the tau particle.

Figure 14.1-A: The Muon Particle [μ]
The pink trusses are anticlockwise, negative charge trusses. The electron [the large, all pink triangle] has three trusses of charge –1/3 each, giving it a total charge of -1 [the charge of an electron]. The attached vane has two trusses – a pink, anticlockwise, negative charge truss, and a brown, clockwise, positive truss. The vane has a total charge of zero. So, the total charge on the muon electron is -1, the same as the electron.

The tau [τ] particle, the heaviest particle in the electron family, has two vanes attached to the electron. Because the vanes both have zero total charge, they do not alter the charge of the original electron.

Each vane must bind to a surface of the neutrino [baked tetrahedral particle] at the vertex of the electron. Because the tetrahedral particle has only four biding surfaces, the electron family can only have three members. The tau is the most massive possible particle in the electron family.

14.3 Baryons

The up and down quarks in the leftmost column of the standard model are the least massive members of the baryon family. The up and down quarks can add vanes, and mass, just like the electron. As in the electron family, the maximum number of sets of vanes that can be added is two, accommodating families having members of three different masses.

14.3.1 Down, Strange, and Bottom Quark family

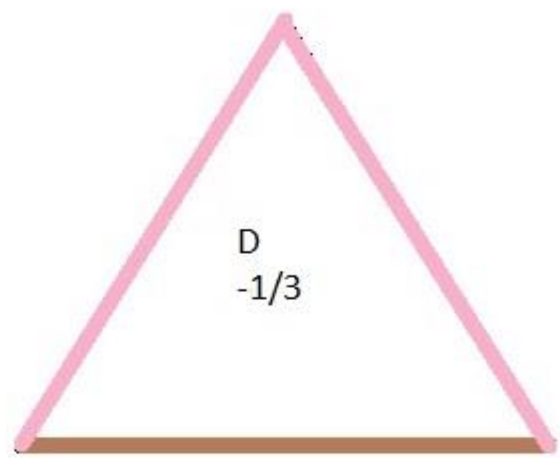

Figure 14.3.1-A: Down quark

The Down quark is found in protons and neutrons. It is made of two anticlockwise, negative trusses, shown in pink in Figure 14.3.1-A, and one clockwise, positive truss shown in brown. It has a net charge of -1/3, one third of the total charge on the electron. Like the electron, under pressure it will add appendages. The Strange quark is the equivalent of the muon electron. The Bottom quark is the equivalent of the tau electron.

14.3.2 Up, Charm, and Top Quark family

The Up quark, like the Down quark, is a component of protons and neutrons. It has a charge of +2/3. Like the electron and down quark, it will add trusses under pressure, creating the charm and top quarks.

The up quark has no base truss. However, the orientation of the tetrahedral surfaces will not support an additional vane. If each vane has a right-handed and a left-handed truss, the charge on the particle will be unaltered. Only the mass, not the charge, will increase.

14.4 Neutrinos

Neutrinos are tetrahedral particles ejected from matter when a truss is split. Ether particles are very robust and rarely split. The neutrinos have tiny size and no charge. They fly through space at roughly the speed of light, mixing with the more massive ether particles [made of five tetrahedral particles]. Because neutrinos are so small, they rarely collide with an ether particle and exhibit their mass. They tend to just slide by ether particles. Occasionally they will encounter the nucleus of an atom. When they hit a nucleus, they do exhibit mass, and release kinetic energy. They may just be absorbed by the nucleus, or they may destabilize the nucleus and initiate fission.

Neutrinos are short trusses. They can be one, two, or three tetrahedral units in length. A four-unit truss can accept a charge, so it is no longer an uncharged neutrino.

14.4.1 Maximum neutrino-size

Trusses always have ether particles interposed between the tetrahedral links of the truss. The geometry of the ether particles, with their greatest thickness in the middle, permits ether particles to be added every 90 degrees along the truss, as shown in figure 14.4.1-A, below.

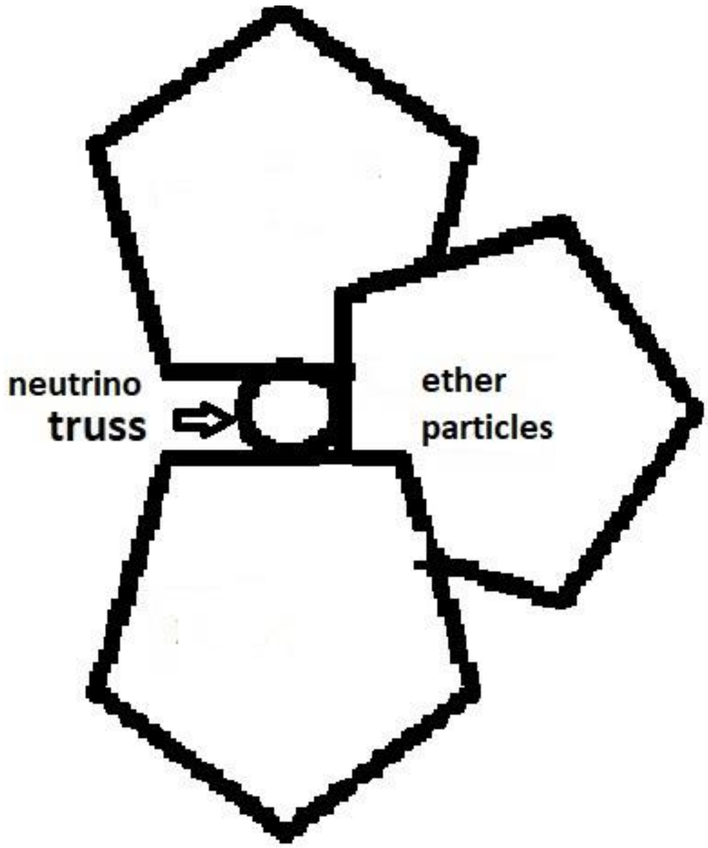

Figure 14.4.1-A: Ether particles interpolated into neutrino truss.

An ether particle, the start of a line of force, can be added to a truss between each tetrahedral unit. A minimum of two parallel lines of force is needed to create an electrostatic bond. Parallel lines of force can occur every four neutrino units on the truss. Because a truss of four neutrino units can create a charged particle, the maximum number of tetrahedral units in a neutrino is three. Adding a fourth tetrahedral unit converts the truss into a charged particle. Neutrinos can be made of one [electron neutrino], two [meson neutrino] or three [tau neutrino] tetrahedral particles. Three particle neutrinos are tiny right-handed or left-handed trusses. They are often referred to as “tau-neutrinos” and “anti-neutrinos.”

Charged four-unit-truss particles may become important tools of nuclear research. Once a reliable supply of the particles has been developed, and a method developed to prevent them from being absorbed too quickly, it ought to be possible to fire the particles through a device like an electron microscope. The improved microscope would offer much better resolution than an electron microscope.

14.5 Forces - Bonds and Particles

The nature of forces forms a critical distinction between the Tetrahedron Conjecture and the Standard Model universes. In Tetrahedron Conjecture universes, forces between particles are exerted by solid bonds. Tetrahedral particle trusses form weak force bonds at the vertices of quarks [section 4.2: Weak Force]. They also form strong force bonds between quarks [section 5.3: Strong Force]. Decahedral, ether particle trusses form electrostatic bonds [section 7: Electrostatic Bonds]. Electromagnetic bonds are a form of electrostatic bond [section 10.1: Electric Current and Electromagnetism]. In Standard Model Universes, forces are exerted by particles – bosons for the weak force, gluons for the strong force, and photons for the electromagnetic force.

14.5.1 Photons

The photon was believed to be the particle that carried the electromagnetic force. Oscillatory photons [created by electrons oscillating in a wire, not blackbody radiation, section 11] do carry radio waves, and radio waves do induce currents in electrical conductors - when they hit a free electron in a wire, they force it to move, creating an electric current. However, they carry no charge. They carry energy but have tiny masses. It is hard to imagine them exerting significant electrostatic or magnetic forces. Attractive and repulsive bonds, described in section 7 above, seem more probable carriers of electrostatic and magnetic force. In the Tetrahedron Conjecture, photons are unattached electrostatic bonds traveling through space. Photons carry radiant energy but have tiny masses. They carry no significant force.

14.5.2 Weak Force Bosons

The W+, W- and Z boson particles are always present when weak force bonds are broken during fission. That led to the idea that they carried the weak force. In the Tetrahedron Conjecture, the weak force holds the trusses of quarks together at their vertices. It is the force exerted by the ends of the trusses that make up quarks. The weak force, exerted on a single surface of a tetrahedral particle, holds the vertices together. It is the weakest point of the quark.

When fission occurs, new trusses of different lengths are formed. Those up to three tetrahedral units in length are uncharged neutrinos. They stream away from the atoms. When they reach the skin of the universe, they are absorbed and recycled into new matter. The remaining, longer, charged trusses form W+, W- and Z particles. They are non-streamlined fission disintegration products from the trusses destroyed during nuclear decay. The charge of the weak force bosons is determined by the preponderance of right- and left-handed truss particles remaining after fission.

14.5.3 Gluons

Gluon particles have never been isolated. The strong force holds quarks together. The Tetrahedron Conjecture candidate for the carrier of the strong force is the strong force truss [section 5.1 – Protons].

14.6 Higgs Boson

The Higgs Boson was detected in 2012. It helps give mass to elementary particles. The Tetrahedron Conjecture offers an excellent candidate for this particle, the aggregate particles described in Section 3: Decahedron Aggregation.

Decahedral ether particles aggregate in the skin of the universe to form loosely bound, roughly spherical particles that are less dense than the surrounding sea of trusses and protomatter. These less dense aggregate particles float towards the low-pressure area at center of the universe.

Eventually the aggregated particles form their own low-density sphere at the center of the universe. At reduced pressure, the aggregated particles are no longer stable. They dissociate into their component decahedra, creating a low-density, bubble interior of the universe. It is decahedral ether particles in the inner universe that cause mass and gravitation. They also create the environment for electrostatic bonds to form, and for photon transmission. The Higgs particle performs a vital transportation function, carrying ether particles from where they are formed, in the skin of the universe, to the bubble [later balloon] inner universe where they cause mass, gravitation, and light transmission.

Causal Universe

15. Indeterminacy, Determinism and Hidden Dimensions

Belief in Universal Determinism, that nothing occurs at random, and that every event has an antecedent cause and successive consequence, is crucial to science and to morality. If events could happen at random, without a cause, it would be impossible to understand or control our environment, which is the purpose of science. Reward and punishment would also be pointless. There would be no possibility of controlling the behavior of others.

The behavior of sub-atomic particles, which underlies the behavior of all matter, is determined but not totally predictable. It is indeterminate. For sub-atomic particles, the only technique available for measuring particle speed or position is to probe with another, similar-sized particle. Because they are stable and can be manipulated, photons and electrons are popular probe choices. The probes and targets have similar sizes. They behave like billiard balls. The interaction with the probe, the act of measuring the speed or position of a subatomic particle, changes the target's speed or position. This makes the target particle's speed and position difficult to determine. Indeterminacy does not mean that that the speed or position of a particle is not determined, just that it cannot be measured easily or accurately.

Furthermore, interactions between electrons suggest that they are not homogeneous particles. The variation in speeds and direction of recoil supports the view that a quark is composite body. The Tetrahedron Conjecture maintains that quarks and leptons are made of trusses. The trusses, in turn, are made of tetrahedral particles. The tetrahedral particles are made of protomatter particles. This nested structure provides Degrees of Freedom at each level of the structure. This freedom of movement within a quark increases the difficulty of predicting a quark’s speed and direction after interacting with a probe.

The Tetrahedron Conjecture supports the existence of a hidden structure within nuclear particles that is too small to resolve with current techniques of microscopy. The conjecture does not support intrinsic electron spins, electron orbitals, or forces acting at a distance. Light is a pressure wave. Quantum mechanics is not an arbitrary set of rules, but results from conventional interactions between complex particles. The Tetrahedron Conjecture explains the evolution of the universe within the familiar three spatial dimensions and one time dimension. It requires a closed universe, luminiferous ether, and accepting that supposedly fundamental particles have complex structures.

Proof

16. Verifying the Tetrahedron Conjecture

There are two problems with proving the Tetrahedron Conjecture. In the case of tetrahedral particles, although the particles exist freely in the universe as electron neutrinos, huge temperatures and pressures are required to synthesize neutrinos into trusses, ether particles, and baryonic matter.

The problem with proving the existence of ether particles and dark matter, is ubiquity. Ether particles are everywhere. They are a structural component of the universe, creating ether pressure and preventing the universe from collapsing. They are also integral components of quarks in baryonic matter. Any test that could possibly detect them zeroes them out as a calibration error.

Although the Tetrahedron Conjecture places phenomena that seem disparate and mysterious into a consistent framework, the critical test of creating an image is elusive. The framework reveals the structure of the universe as a consequence of the geometric and adhesive properties of the tetrahedral particle. The tetrahedron conjecture provides a mechanism that underlies both quantum mechanics and relativity theory. The structure and adhesion of the tetrahedral particle [the electron neutrino] leads to quarks, atoms, stars, heavy elements, life, and as an end point, black holes.

16.1 Imaging Ether Particles or Trusses

There is no prospect of isolating and imaging an ether particle. The normal method of creating an image of an object is to isolate the object, then focus a stream of smaller objects to create the image. Even if a way could be found to focus neutrinos and create an image, ether particles are everywhere in the universe. They cannot be isolated. They even form integral components of quarks, the smallest detectable particles of matter. Although interiors of quarks cannot be resolved microscopically, it is known that smaller particles than quarks do exist. Electron neutrinos are a common product of nuclear reactions. They exist freely in nature and are much smaller than quarks. This makes it likely that quarks are made of neutrinos.

16.2 Digital Model

It would be reassuring to build a digital model of the universe. The model would test if the tetrahedron conjecture was mechanically, as well as spatially, feasible. A physical model can demonstrate spatial plausibility. A digital model is needed to show that a single, consistent force between tetrahedral particles can explain the existence of the universe, and the many phenomena observed within it. An ideal digital model would be able deduce every property of the universe from the geometric and adhesive properties of the tetrahedral particle.

That would be far from the end of physics. Protomatter also has adhesive properties, suggesting that it is, itself, a composite body. In addition, the properties of the void require study. Ether pressure, which is critical to holding matter together, is not present in the void. It is hard to imagine doing more than speculating on the properties of the void.

16.3 Historical Perspective

The situation is like germ theory before the compound microscope, viruses before the electron microscope, and the atom before the atomic force microscope. There was ample evidence to support the existence of all these bodies. Images made their existence a certainty. There is ample circumstantial evidence to support the existence of ether particles. They explain cosmic evolution, wave-particle dualism, and time dilation within a gravitational field. Creating an image of an ether particle would clinch arguments about its existence.

17. Cosmic and Biological Evolution

Evolution provides a mechanical, unguided means of creating complex structures from simple precursors. The Tetrahedron Conjecture shows how raw protomatter is converted to homogeneous tetrahedral particles by constant bombardment. Homogeneity is enforced because only the most robust particles survive. Geometry determines particle ruggedness and survival. The structure of every object within the universe is determined by the geometry of the tetrahedral particle.

Despite the apparent randomness and diversity of the universe, it is built from homogeneous particles. The universe is fundamentally a uniform, self-assembling structure. Tetrahedral particles evolved into nuclei and atoms. Atoms evolved into stars, planets, and life.

Once heavy elements and condensed planets, able to support chemical reactions, had emerged, biological evolution could begin. There are four leading chemical theories for the origin of life. Life is thought to have started at ocean vents, on clay, on obsidian glass, or under ice. Life depends on chemical energy. Once photosynthesis evolved, it provided a global habitat for life, and increased the food supply. Increased food supply, and more varied habitats, spurred evolution.

All forms of evolution require an energy-source. Cosmic Evolution was, and still is, powered by Constant Creation. That is, by the Single Unending Creation Process first proposed 2,000 years ago by Lucretius.