

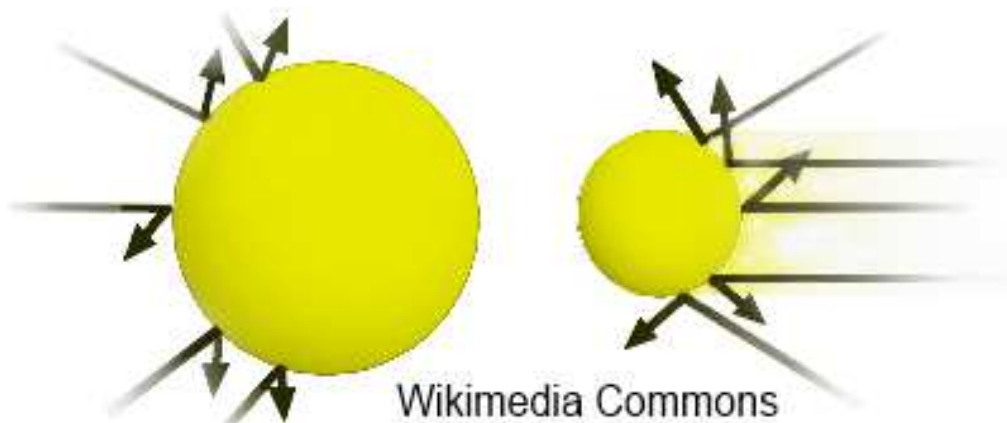
Visual Model of Electromagnetic Interactions of Sub-Photons

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Abstract: This paper provides a visual based conceptual model and framework to help explain the behavior of electrical, electromagnetic and gravitational phenomenon that is consistent with basic knowledge in the field. This model both reinforces current electrical behavior and introduces new possibilities for further research. A conceptual particle is introduced, referred to as a sub-photon by this paper. The proposed framework relies on previous research in controversial physical models such as repulsive gravity and a fractal universe. Despite its reliance on controversial models and assumptions, the model is intuitive in many respects, easy to visualize and not reliant on difficult mathematics. If this model is adopted by teaching institutions, it may help students learn more visually and intuitively.

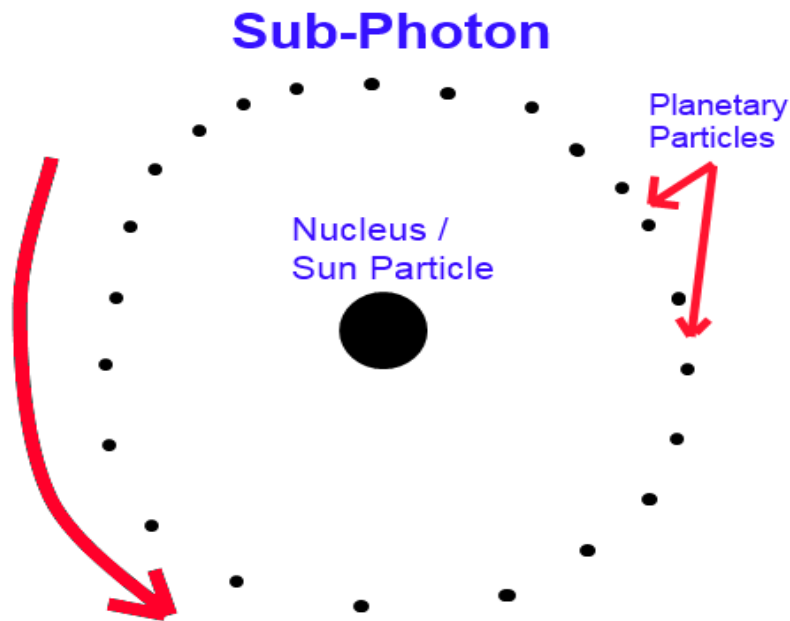
Basic underlying assumptions:

1. Gravity is pushing or repulsive force. (All forces are repulsive/pushing)..
2. The universe is fractal in nature, consisting of increasingly smaller and smaller particles.
3. Smaller particles in the fractal universe are the building blocks of larger particles.



New Visual Concepts:

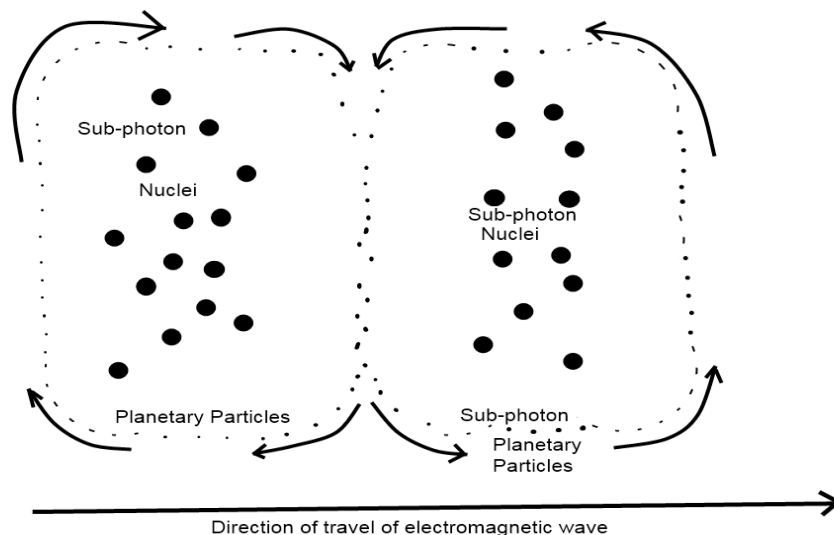
1. Both gravitational and electromagnetic waves are caused by the same extremely small particles whose size is a fraction of the smallest electromagnetic wavelength.
2. Gravitational and electromagnetic waves differ only in their wavelengths.
3. The Sub-photon is the newly introduced particle that is the building block for construction of both gravitational and electromagnetic waves.
4. Sub-photon is the particle that is the building block of elementary subatomic particles.
5. A sub-photon consists of a nucleus (sun) particle and rotating planetary particles.



Electromagnetic Waves:

1. Traveling sub-photons that are polarized in alternating directions create an electromagnetic wave or gravitational wave.
2. Electromagnetic waves have a wavelength that resonates with atoms or larger objects.
3. Sub-photon particles of electromagnetic waves originating in space resonate with atoms in the outer layers (atmosphere, crust) of celestial bodies and exert a force (radiation pressure) there.
4. Gravitational waves indirectly increase physical pressure in a celestial body by a cumulative effect of radiation pressure on subatomic particles.
5. Objects and celestial bodies are pushed together by radiation pressure of sub-photons in gravitational waves due to a difference in pressure. One side of the celestial body is exposed to more gravitational waves while the other side is exposed to less (shielded area).

Sub-Photon Nuclei Grouping Along a Wavefront

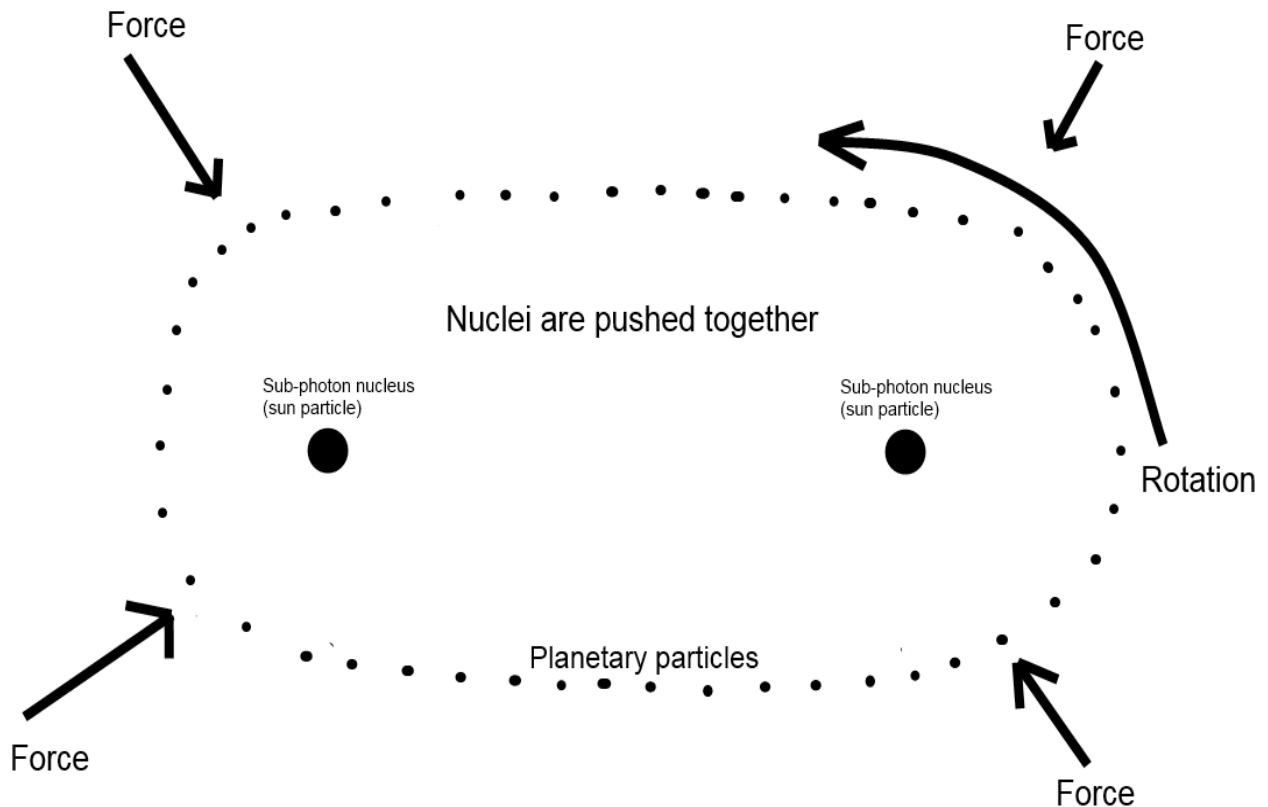


Gravity:

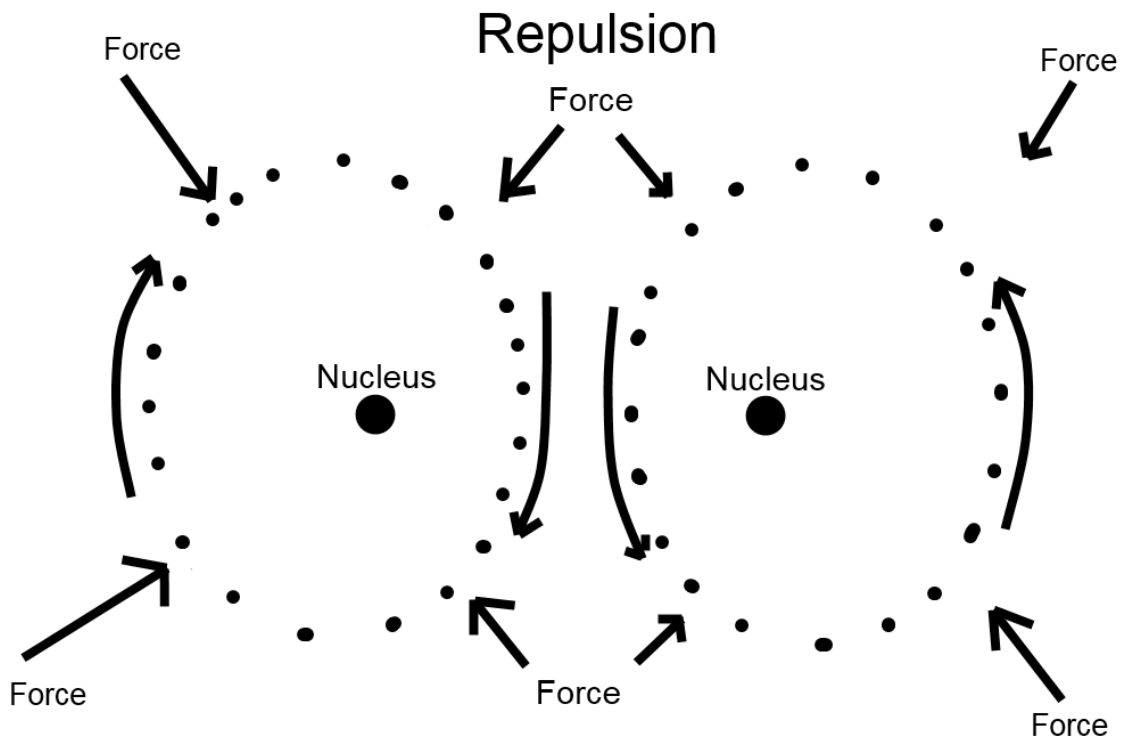
1. Gravitational waves are composed of sub-photons with a wavelength that does not resonate with entire atoms, molecules or larger objects.
2. Gravitational waves typically have extremely long wavelengths.
3. Gravitational waves can have sub-photons that are randomly oriented or extremely high frequencies.
4. Waves of sub-photons can exhibit both gravitational wave effects and electromagnetic wave effects, especially for waves of very low or extremely high frequencies.
5. Sub-photons of gravitational waves interact and exert radiation pressure on subatomic particles.
6. Gravitational waves cause a weak radiation pressure when individual sub-photons impact with subatomic particles.
7. Sub-photon particles of gravitational waves contribute to physical pressures in celestial bodies by a cumulative effect on large numbers of subatomic particles.
8. The repulsive forces and interaction by sub-photons of gravitational waves supports subatomic structures.

Sub-Photon Interactions:

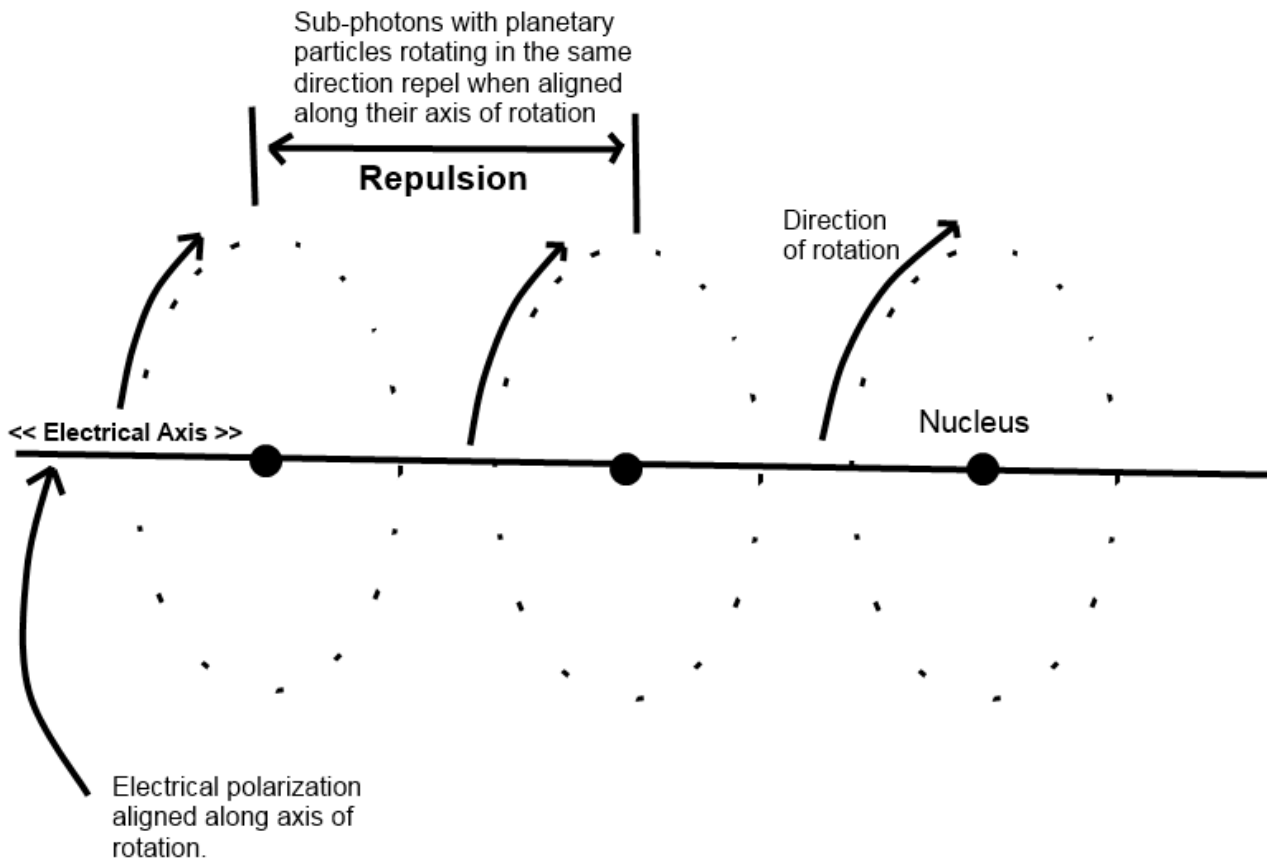
1. Sub-photons that are aligned along their planes of rotation and have planetary particles that are rotating in the same direction will have their sub-photon nuclei (sun particles) pushed together. The sub-photon's orbiting planetary particles will tend to follow the same path, causing a "shielding effect" around their respective sub-photon nuclei. This "shielding effect" provides the force that pushes the sub-photon nuclei together.



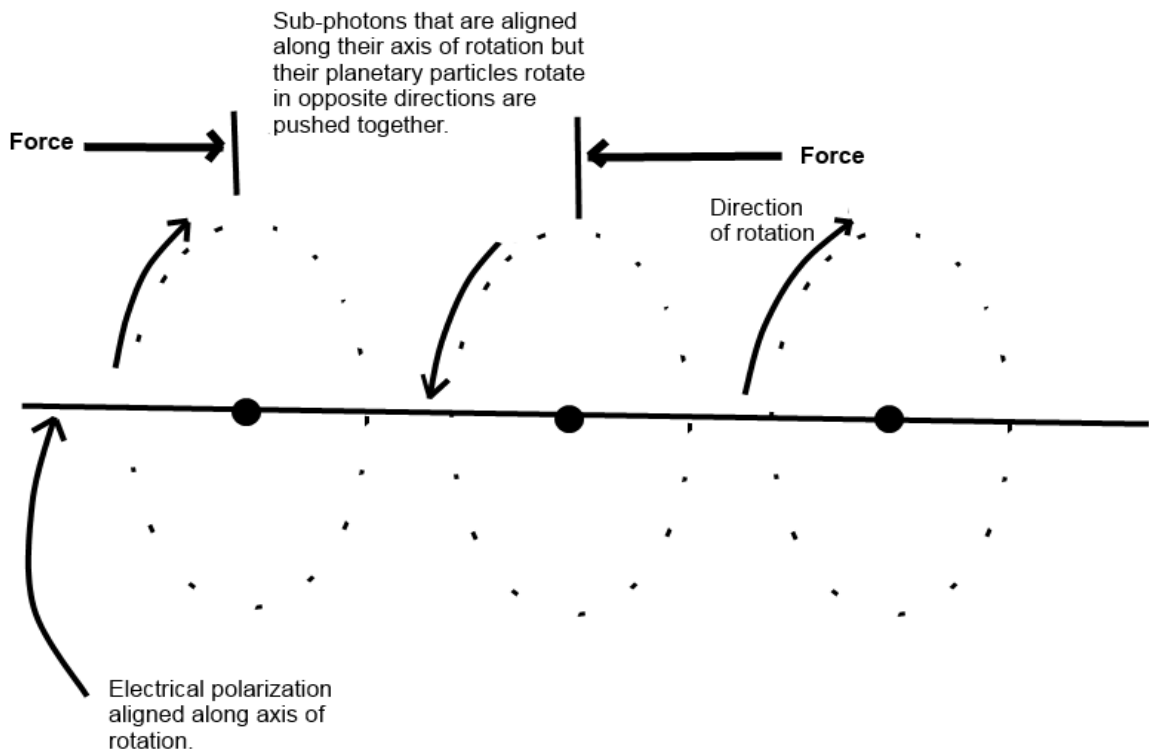
2. Sub-photons that are aligned on their planes of rotation but their respective planetary particles are rotating in opposite directions will repel each other.



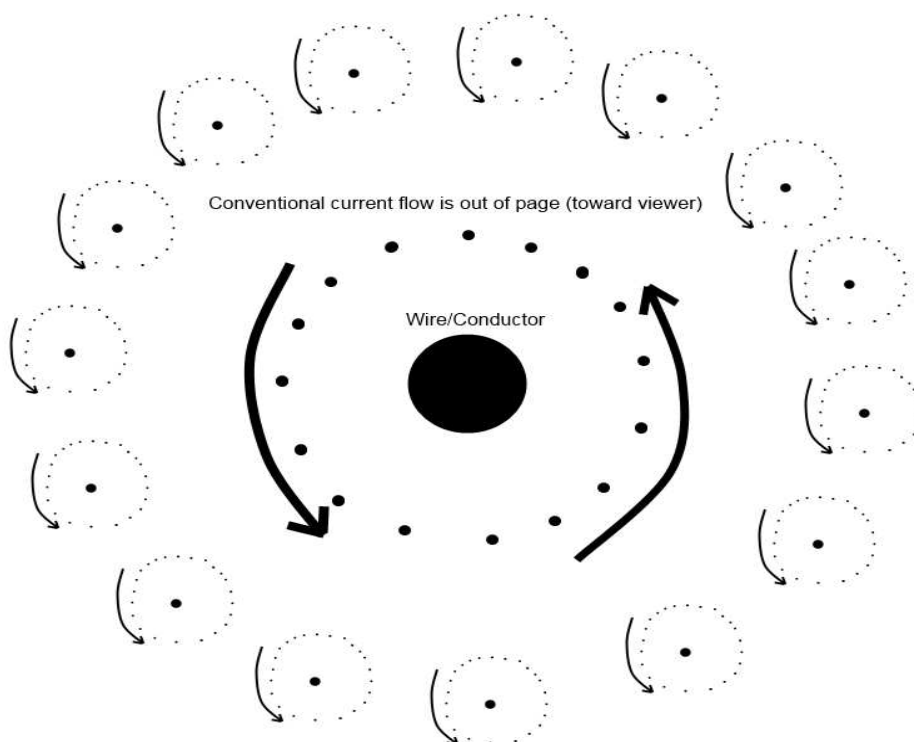
3. Sub-photons that are aligned along their axis of rotation (electrical axis) will repel each other if their planetary particles are rotating in the same direction.



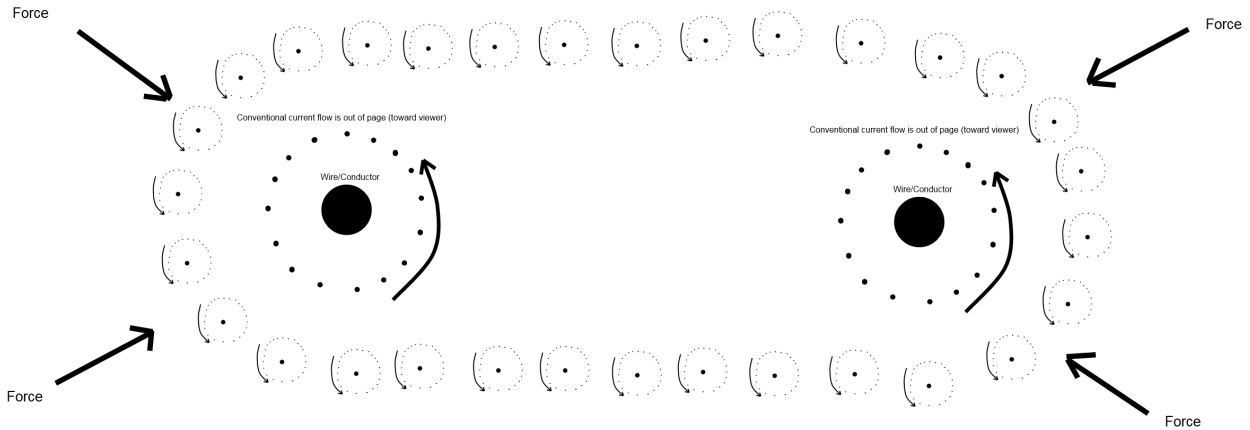
- Sub-photons that are aligned along their axis of rotation and have planetary particles that are rotating in opposite directions will attract each other.



- Electrical current creates a rotating “cloud” of sub-photons around the conductor with their direction of rotation dependent on the direction of electrical current.



6. Parallel conductors that have sub-photon “clouds” rotating in the same direction will be pushed together based on principles previously described.

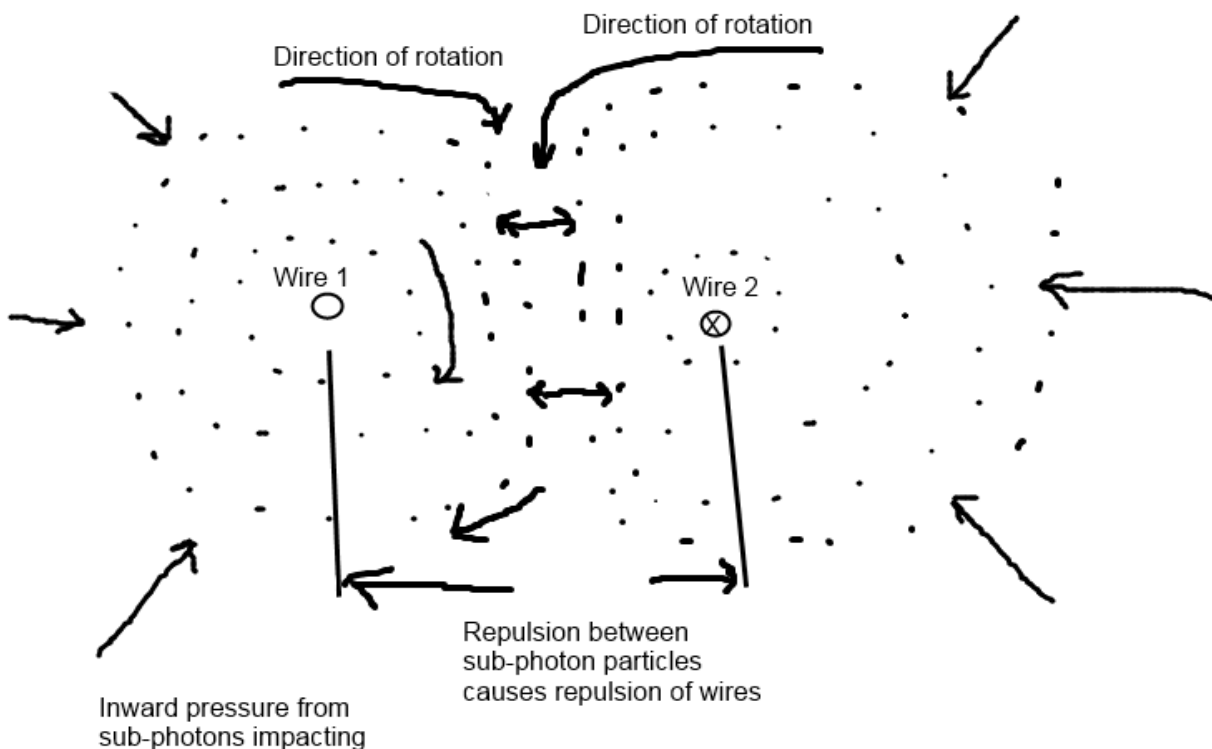


7. Parallel conductors that have sub-photon “clouds” that are rotating in opposite directions will be repelled by principles previously discussed.

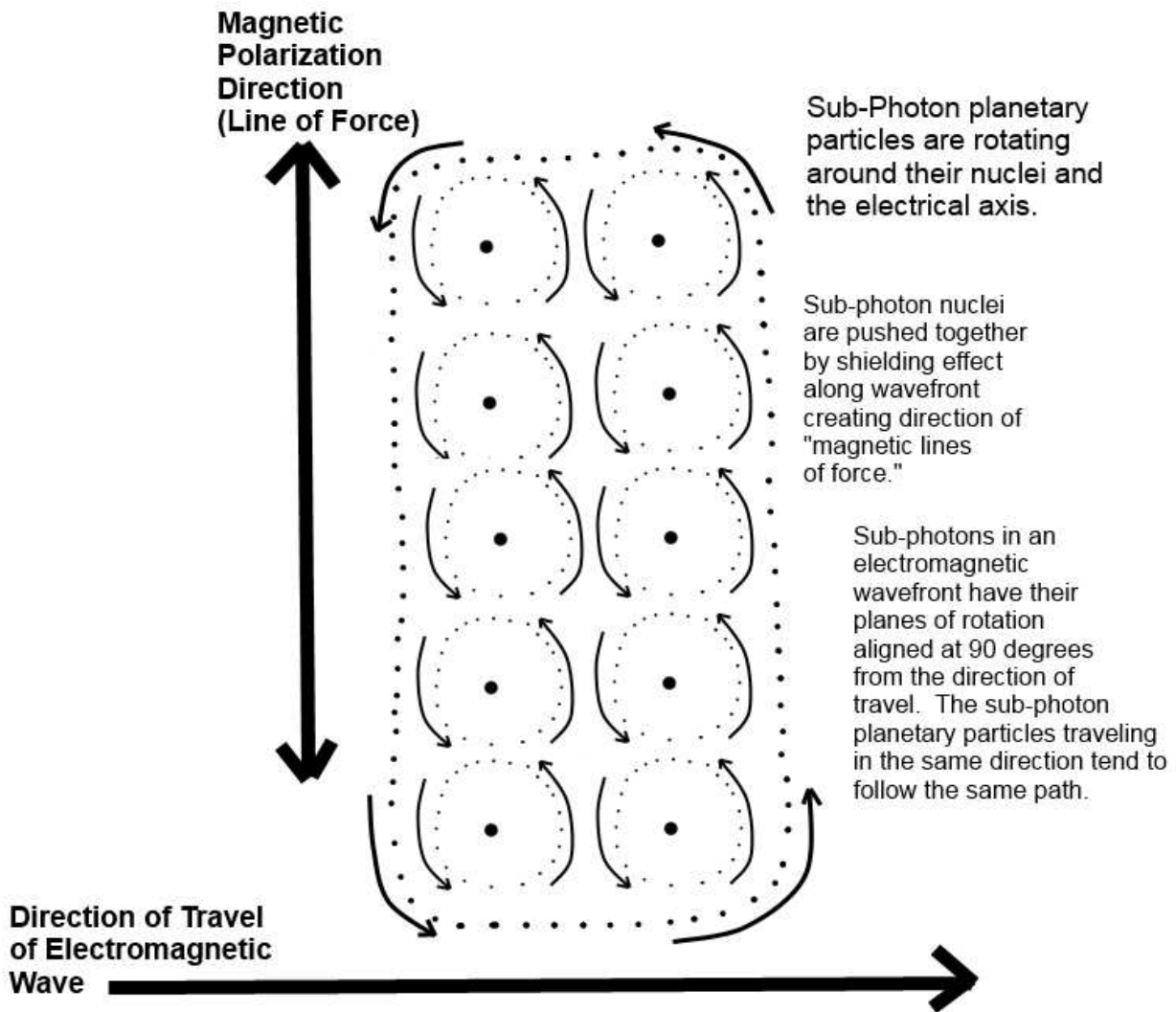
Current flow in wires is parallel but opposite in direction
Causes repulsion of wires

Lorentz force (repulsion)

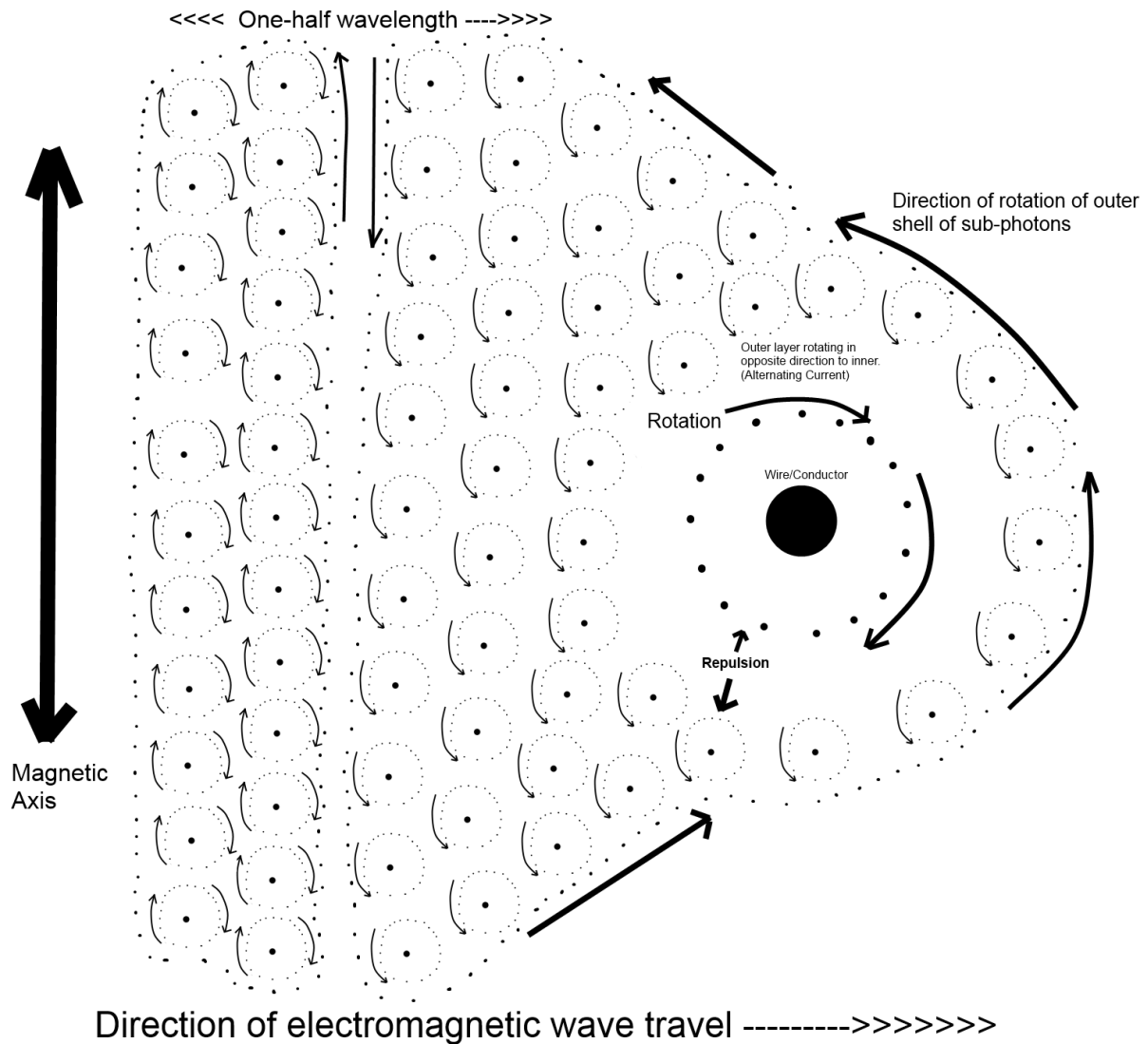
Sub-photon particles are unable to share same paths (no cooperative shielding)



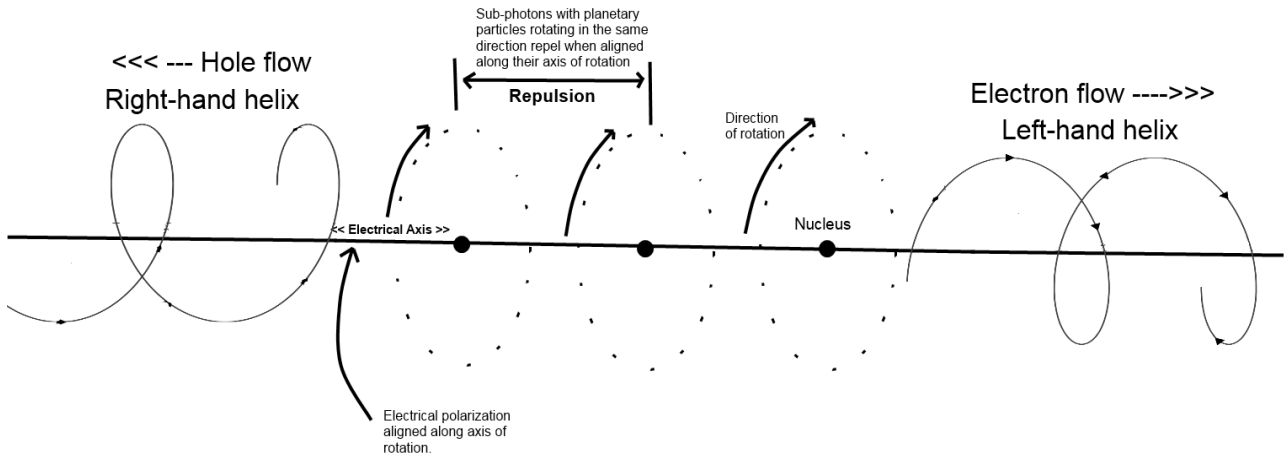
8. If sub-photons along a wavefront of an electromagnetic wave are aligned along their planes of rotation and rotating in the same direction, these sub-photons will be pushed together. This attraction of sub-photons along a wavefront causes a magnetic axis and a “magnetic line of force” in traditional nomenclature.



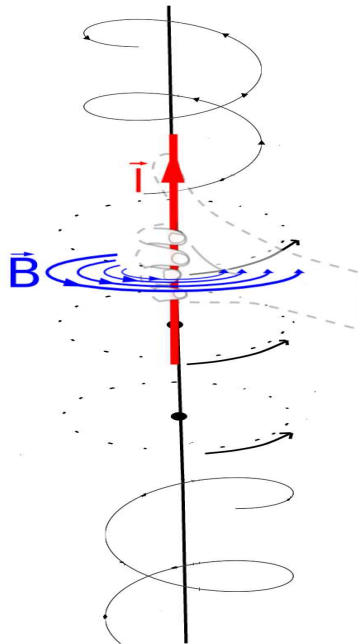
9. The illustration below shows an electromagnetic wave approaching an antenna or other conductor. The sub-photon planetary particles are shown rotating around their nuclei. The nuclei lie move as the wavefront travels. As the wavefront approaches the conductor, the sub-photon planetary particles surround the upcoming conductor, generating an inductive field of planetary particles around the conductor. This field repels underlying sub-photons that have planetary particles rotating in the opposing direction. This outer field compresses the inner field of oppositely polarized sub-photons closer to the wire and their sub-photon nuclei are incorporated into the atoms of the conductor. Notice the electromagnetic wave causing a counterclockwise circulation in this example. The field caused by the counterclockwise circulation of sub-photon planetary particles causes compression of sub-photons with planetary particles rotating in the opposite (clockwise in this example) direction.



10. After sub-photons are compressed along the antenna/wire, some sub-photon nuclei are incorporated into atoms of the wire. As the lower field of sub-photon planetary particles become compressed by the counter-rotating field above them, they are forced into an axial alignment. Once sub-photons are aligned axially and rotating in the same direction, the repulsion between sub-photon nuclei pushes these nuclei along the conductor. Since these axially aligned sub-photons have planetary particles rotating in the same direction but they travel axially in opposing directions, a helical structure is formed along the conductor. Sub-photons traveling as a left-handed helical structure cause electrons to be pushed into this direction. Sub-photons traveling as a right-handed helical structure cause the formation of “holes” as per common electrical terminology. The following illustration shows a left-handed helical structure that corresponds to electron travel in the conductor.

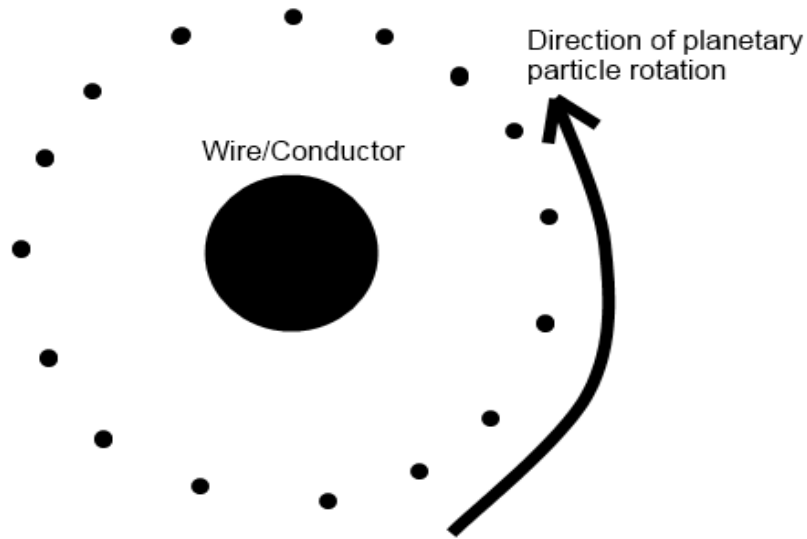


11. The illustration below shows the right hand rule for determine the direction of magnetic field lines based on conventional current flow. Notice how that direction of rotation of planetary particles conforms to the right hand rule. Conventional current flow (hole flow) is in the direction of the thumb and electron flow in the opposite direction.

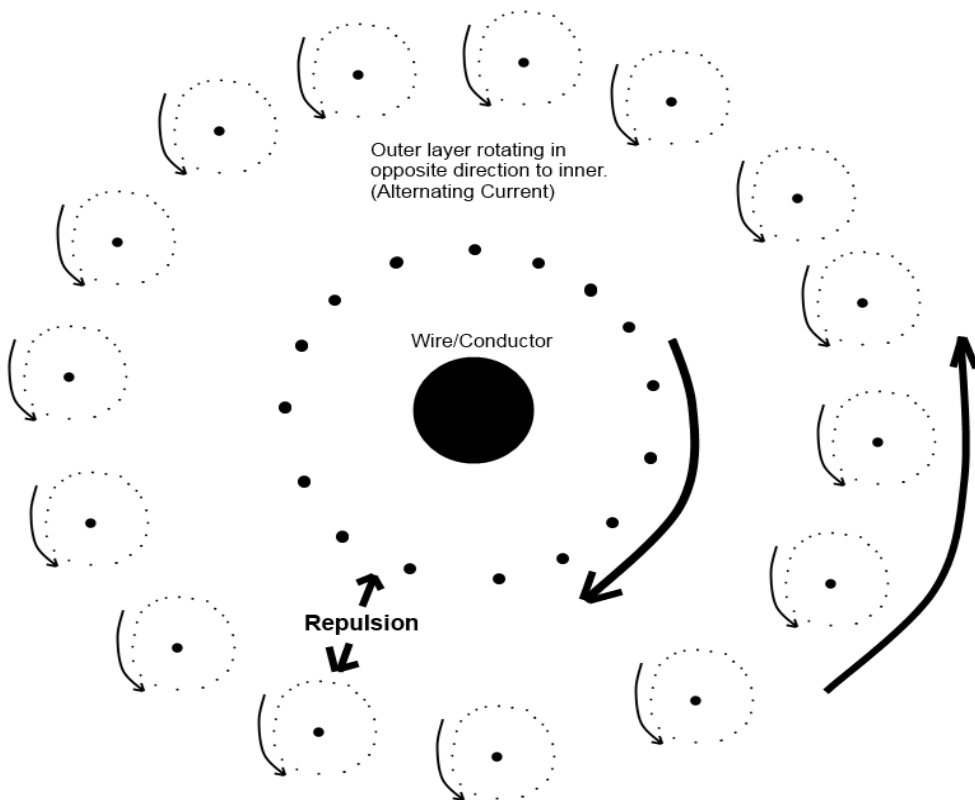


12. Similarly to the situation previously presented when an electromagnetic wave approaches a conductor, when current flows in a conductor, it creates a "bubble" or "shield" around the conductor composed of sub-photons rotating in a direction according to its current flow.

Conventional current flow is out of page (toward viewer)



13. If the current flow in a conductor reverses (alternating current), a layer of sub-photons with opposite polarizations will be created inside of the existing sub-photon “bubble.” Since these layers of sub-photons are oppositely polarized and oriented along their planes of rotation, they will repel each other. This repulsion will cause the outer layer to be expelled into space, creating an electromagnetic wave.

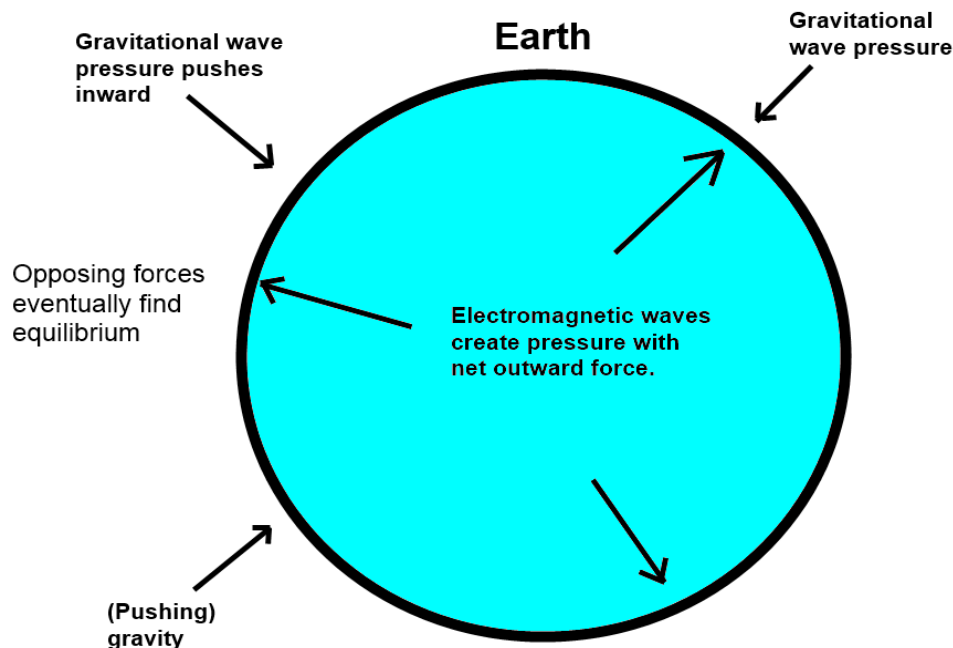


14. Magnetism is a force created when sub-photons circulating around atomic nuclei are either pushed together by rotating in the same direction or repelled by traveling in the opposite direction.

15. Induction is an energy built up by the "bubble" or "shielded area" around a conductor. The "bubble" is created by aligned sub-photons traveling in the same direction. This "bubble" of inductive energy can be created by an electromagnetic wave of sub-photons that travels near a conductor. The "bubble" can also be created by current passing through a conductor. The larger the area and the more concentrated the sub-photons in the "bubble" is, the more energy is stored by induction.

Celestial Bodies:

1. Atoms, molecules and larger structures within a celestial body itself create electromagnetic waves. These waves, due to their higher likelihood of resonance and interaction compared to gravitational waves, tend to exert their radiation pressure on nearby atoms or larger structures, most of which are within the celestial body. Pressure created by electromagnetic waves within a celestial body creates an average force outward from the core that tends to oppose pressure caused by gravitational waves that tend to be directional toward the core.
2. Physical or "molecular" pressure caused by the proper resonant wavelength of electromagnetic waves pushes atoms together to form larger atoms (nuclear fusion).
3. The smallest elementary subatomic particles are constructed of "packaged" sub-photons.
4. Larger sized elementary particles are constructed of groups of smaller elementary particles.
5. Composite particles are composed of "packaged" elementary particles with preference for stable arrangements.
6. Atoms or groups of atoms can absorb and radiate sub-photons as electromagnetic waves or subatomic particles.
7. Sub-photons that have interacted with atoms or groups of atoms are polarized in alternating directions, causing electromagnetic waves.
8. The frequencies of the electromagnetic wave emitted depends on the matter or object's resonant frequencies.
9. Larger atoms are capable of absorbing, storing, transforming and eventually emitting sub-photons as either electromagnetic waves (sub-photons), elementary particles or composite particles.



Gravitational shielding of celestial objects:

1. Concept that the concentration of gravitational waves (composed of sub-photons) in space is

- finite and that large celestial objects can, by way of their large mass, transform most or all incoming gravitational waves into electromagnetic waves and internal physical pressure.
2. The concentration of gravitational waves in a large celestial object will gradually diminish towards the core of the object due to transformation into electromagnetic waves or particles.
 3. The probability that a gravitational wave will interact with subatomic particles of an atom is increased when atoms are of higher atomic mass.
 4. The concentration of sub-photons in gravitational waves in space limits the theoretical size of a celestial object.
 5. Theoretically higher concentrations gravitational wave sub-photons in different areas of space can create an environment that supports larger celestial objects.
 6. Areas in space of gravitational shielding (reduced concentration of gravitational wave sub-photon particles) are present near large celestial objects.
 7. Large celestial objects that are near each other in space will be pushed together
 8. Force of gravitational waves on one side of object provides the "push"
 9. Areas of gravitational shielding between objects create an "absence of push."
 10. Large objects will be pushed together toward the areas of gravitational shielding

Large celestial objects.

Atmosphere and Outer crust:

1. Are impacted by a high number of gravitational wave particles (sub-photons)
2. Have a high "gravitational wave pressure" from space due to the large number of impacts from gravitational waves.
3. Have a low internal physical pressure due to its location in the crust.
4. Atoms with a high molecular weight have more interaction (due to numbers of protons and neutrons) with gravitational waves and are pushed inward towards the core by radiation pressure.
5. Pressure of gravitational waves on electrons pushes electrons toward the center of the celestial body and away from the atmosphere and crust. This creates an electron (voltage) gradient with outer atmosphere the most positive compared to the crust. This gradient also contributes to the ionization of the gases of the outer atmosphere along with electromagnetic radiation.
6. Heavier elements in outer layers gradually decay (radioactivity) due to lack of physical pressure and lower electron density (neutron decay).

Middle region (between crust and core)

1. Has the highest concentration of electrons (and lowest ionization levels) of all the layers of the celestial body.
2. High electron concentration causes stability of neutrons.
3. Combination of neutron stability, moderate gravitational wave radiation pressure and moderate physical pressure in this region pushes atoms and nuclei together, forming heavier elements (nickel, lead, iron, uranium, etc)
4. Physical pressure is higher than the outer crust

Inner Core (Exists only if celestial body is large enough):

1. Gravitationally shielded by outer layers
2. Reduced or no gravitational wave pressure creates instability of subatomic particles.
3. Reduced electron density due to lack of gravitational wave radiation pressure creates instability of neutrons, transforming some neutrons into protons.
4. Excess of protons, instability of subatomic particles, very high physical pressure, high

- electromagnetic wave density (heat) creates an unstable atomic environment.
5. Area of nuclear fission.
 6. Combination of low gravitational particle pressure (unstable subatomic particles), low electron density (unstable neutrons) and high physical/molecular (actual) pressure triggers nuclear fission.
 7. Nuclear fission causes generation of electromagnetic waves (heat) in inner cores of large celestial objects
 8. Fission creates lower molecular weight elements (hydrogen, helium, lithium, oxygen etc) in cores of large objects.
 9. Maintains low densities but high physical pressures in the core
 10. Earth likely has area of gravitational shielding at its core:
 11. Producing lighter elements from heavier ones for production of atmosphere and water.
 12. Lower mass objects (asteroids, moons, small planets) are likely too small to have an active inner core.
 13. Cooler in general compared to larger objects due to less heat production (no nuclear fission)
 14. Diameter of a celestial object (due to greater surface area) largely determines amount of heat produced and lighter elements produced in its core.
 15. Larger celestial objects have larger surface to contact gravitational waves which equates to larger electromagnetic wave (heat) production and higher amounts of light element production.
 16. Radiation pressure from gravitational waves translates to physical pressure in the core.
 17. Electromagnetic wave energy density and physical pressure in the core is proportional to rates of nuclear fission, thus heat production and light element (hydrogen, helium, etc) production.
 18. The reduction of gravitational wave radiation in the core due to shielding contributes to nuclear fission.
 19. Larger celestial objects can produce rates of nuclear fission great enough to “shed” a substantial amount of mass (particles and electromagnetic waves).
 20. The “shedding” process described above limits the size of celestial objects to those observed in the universe.
 21. A constant flow of gravitational waves, electromagnetic waves and subatomic and atomic particles is necessary to maintain the size and energy production of celestial objects.
 22. If the celestial body is large-enough and rates of nuclear fission in the core is high-enough, the core of the celestial body may be much less dense than the middle and outer layers. This core layer may contain widely spaced atoms and electromagnetic waves predominantly in the infrared or higher range. Radiation pressure from electromagnetic waves keeps the atoms spaced apart in the core.

See illustration below:

Celestial Body Concept

