GEMM THEORY

1. GEMM Theory establishes parity of matter and anti-matter at a fundamental level in the Big Bang and the creation of the Universe.
2. GEMMs fill the “vacuum” of space and provide a medium for movement of forces such as radiation, gravity, and electromagnetism.
3. The network of GEMMs provides the equivalent of “vacuum energy”, the repulsive effect of Einstein’s Cosmological Constant, and explains the increasing rate of expansion of the Universe.
4. FIM defines a quantized increment of mass that extends the Planck – Einstein relationship to the lowest level of radiation.
5. Explains why the mass transfer of a photon is precisely twice that of normal mass traveling at the speed of light in a vacuum.
6. Almost doubles the calculated mass of the Universe by including the mass of GEMMs. There is a much greater effect on the calculated energy of the Universe.
7. Provides a relatively simple physical model for the development of atoms from the Big Bang.
9. Introduces the fundamental property of “spin” as it appears in the circular polarization of light.
10. Suggests how the parity of negative charges (n-ZEPs) and positive charges (p-ZEPs) at the fundamental level might lead to the lack of parity between electrons and positrons, and between neutrons and anti-neutrons.
11. Provides a mechanism for the production of neutrinos in the mutual annihilation of electrons and positrons.
12. Presents a basis for communication through the “Fabric of Space” to explain some metaphysical phenomena.
Einstein wrote\(^1\), “If a body gives off the energy E in the form of radiation, its mass diminishes by \(\frac{E}{c^2}\)....The mass of a body is a measure of its energy-content; if the energy changes by E, the mass changes in the same sense”. He didn’t say how this might happen, but suggested that clues might be found in the study of emissions from radium salts and radiant energy. This work represents a study of how those changes might occur and the consequences of that occurrence. It begins with the recognition that all radiant energy is characterized by its frequency, regardless of its magnitude over an enormous range of electromagnetic spectra.

Throughout the Universe, mass (as we know it) is constantly reacting by mutual annihilation with equal masses of antimatter, emitting radiant energy at a frequency determined by the amount of mass and energy that disappears from one location and reappears at other locations. The entire mass is constantly receiving radiant energy at various frequencies from the rest of the Universe, absorbing the energy as created mass and antimatter. Other reactions and conditions are occurring within the mass, transferring energy in various forms such as thermal, kinetic, electromagnetic, etc.

Radiant energy is created and absorbed at the atomic level or lower, for the most part involving neutrons, protons, and electrons along with much lesser amounts of their antimatter counterparts and sub-atomic matter.

This was my overview of radiant energy when I wrote\(^2\) that a possible form of Dark Matter involved tiny particles that permeated all space and all matter and were therefore undetectable by existing science. Such particles would provide the antimatter required in the emission of radiant energy. The possibility of such matter is supported by Einstein’s recognition that “space is not nothing” and Hawking’s contention that a “true vacuum” cannot support fields such as gravity and electromagnetism. This simple concept of the conversion of mass to radiant energy emitted into a medium of antimatter to be absorbed by other masses and converted back to mass places severe limitations on the properties of such matter. The present accepted view of radiant energy suffers from the absence of a medium to transfer that energy. This absence leads to the flawed concept of Duality,


\(^2\) https://web.mst.edu/~gbert/GEMM/GEMMs.pdf
adding mass and momentum to transmitted radiation. GEMM theory provides that medium with the complete conversion of mass to radiant energy on emission and the recovery of mass on absorption.

A current view of the interconversion between energy and mass is summed up as “The energy of visible-light photons falls far below that of the least massive subatomic particles. There is nothing else those photons can become, and so they live happy, relatively uneventful lives.”\(^3\) This is obviously a light-hearted comment in an entertaining presentation, but it represents the type of answer I have received when I’ve asked the question as to the nature of the mass that disappears into radiation and reappears elsewhere. This suggests that the photon carries not only the energy of the annihilated mass but also memory of the structure of that mass. It fails to recognize that those photons had to be created in the annihilation of mass somewhere, and they must be absorbed as mass by other mass (and perhaps re-emitted at a different wavelength) somewhere else irrespective of the amount of mass they represent. This is the “magic” of Physics along with “virtual” states unrestricted by the reality of a mechanism and consideration of parity or even entropy.

Radiant energy is transmitted as wavelike photons delivering energy proportional to its frequency \((\nu, \text{cycles/sec})\) multiplied by the Planck constant \((h, \text{J-s})\);

\[
\Delta E = h\nu ,
\]

which quantizes the delivered energy of a single cycle of the wave. Einstein relates the delivered energy to the observable rest mass \((m)\) which is annihilated in creation of the emitted photon and re-created on absorption multiplied by the square of the speed of light \((c)\):

\[
\Delta E = mc^2 .
\]

Radiant energy travels as a wave of force alternating hills and valleys of opposing forces in each complete cycle of the wave, representing the energy of equal increments of observable matter and antimatter. The actual mass which disappears from one point and appears at another must represent the annihilation of equal amounts of observable matter and antimatter. The calculated energy change must be independent of the

\(^3\) Neil de Grasse Tyson, Death by Black Hole, Section 7 #40.
manner in which that transfer might be accomplished – either as kinetic energy of mass travelling at the speed of light or as the conversion of mass to massless radiant energy on emission and the reconversion to mass on absorption. The actual mass represented by each cycle of the wave is then twice the observed mass, \( \frac{h}{c^2} = 7.3727 \times 10^{-51} \text{ kg/cycle} \). This is the combined rest mass of the visible matter and antimatter particles which are mutually annihilated in the conversion to one cycle of the photon’s energy.

Visible matter is primarily composed of neutrons, protons, and electrons and smaller amounts of positrons and anti-protons. These are composed of the tiny bits of matter which must have mass and charge plus the “stuff” that provides the interactive forces involved in their energy and structure. Radiant energy must contain these properties plus any others that comprise the antimatter particles. Physics recognizes mass and charge plus the Strong Force, Weak Force, Electromagnetic Force, and Gravity. The tiny particles of visible mass are attracted and bind to other visible mass with the Strong Force. These are the Fundamental Increments of Matter (FIMs). The tiny increments of antimatter must contain a repulsive force which prevents them from aggregating, thus spreading them out through all space including the “empty” space within atoms. These provide a medium for forces to operate and are called Gravitic Electric Magnetic Matter (GEMMs). The Strong and Weak Forces of Physics may be replaced by Attractive Force and an equal but opposite Repulsive Force. Gravity could result from a combination of these two forces. The Attractive Force is augmented by Electromagnetic attraction between the closely-packed dipoles of FIMs in nuclei. Electro-magnetic force exists as both positive and negative forces within nuclei as well as between charged entities.

Atoms contain uncharged neutrons and the charged matter of protons, electrons, anti-protons, and positrons. Neutrons, protons, and anti-protons (and possibly anti-neutrons) can be reduced to smaller entities such as quarks, but electrons and positrons cannot. They are regarded as fundamental particles in the Standard Model of Physics. Mutual annihilation of both mass and charge in electron – positron collisions requires that the two are inseparable. Uncharged neutrons must therefore contain a balance of positive and negative charges in electrical dipoles (or
higher combinations). Such combinations must exist in both FIMs and GEMMs. Both charges carry a fundamental form of mass. FIMs are normal matter (visible mass) with attractive force and an electric dipole while GEMMs are anti-matter with repulsive force and an electric dipole. These form the minimal set of properties required for these fundamental entities.

Mutual annihilation of a FIM and a GEMM must emit a single cycle of two increments of radiant energy, each created from increments of mass with positive and negative mass/charge plus increments of positive and negative force. The reverse process must occur when the energy is absorbed. Both processes occur at the surface of normal mass. FIMs become part of the absorbing mass, strongly bound by attractive Force and electromagnetic forces. GEMMs are ejected from that mass into the surrounding space. These entities distribute themselves throughout space, including the space within atoms. They interact with each other through electromagnetic forces of spinning dipoles, repelled by all normal mass through their repulsive force. This interactive network forms the “Fabric of Space” and provides a medium for the transmission of radiant energy and possibly gravitational force. That process began with the Big Bang, with clusters of FIMs growing into highly energetic neutrons, each containing the measurable mass of the order of $10^{23}$ FIMs or more.

**The Box of Everything**

The earlier work postulated that transitions between mass and radiant energy involve an intermediate state in which the dipoles of a FIM and a GEMM are combined to form a quadrupole which contains their increments of positive and negative force. The quadrupole contains the components of two increments of radiant energy, one cycle of a photon. These transitions are illustrated with a graphic representation of this quadrupole as a cube with the four components of radiant energy as different colors at the corners.

The transition between an increment of mass-plus-antimass and two increments of radiant energy involves the energy of annihilation of increments of Matter and Antimatter on the surface of normal mass. These increments of energy form photons as clusters of “Boxes” proportional to
the frequency at which these reactions are occurring, emitted into the network of GEMMs and travelling at the speed of light.

The opposing faces of this cube are paired as A1,A2 (radiant energy); B1,B2 (FIM, GEMM); C1,C2 (n-ZEP, p-ZEP); and may be separated by one of the three dividing planes. A p-ZEP has two increments of positive charge and an n-ZEP has two increments of negative charge. These are the basic materials of charged matter, each with the same mass as a FIM or a GEMM. These increments of charged matter are designated as zeptocharges because their mass and charge are of the order of roughly $10^{-21}$ times that of an electron or positron. The intermediate state can be created by the mutual annihilation of p-ZEPs and n-ZEPs, and may be transformed into either a photon or pairs of FIMs and GEMMs. All transitions between mass and radiant energy, which started with the Big Bang and continues throughout the Universe, must go through this intermediate state – The Box of Everything.

Normal matter (FIMs) is radiant energy with most of its Repulsive Force replaced by Attractive Force. Antimatter (GEMMs) has most of its Attractive Force replaced by Repulsive Force. To form ZEPs from radiant energy a negative charge is replaced by a positive charge to create a p-ZEP, and a positive charge is replaced by a negative charge to form an n-ZEP.
ZEP. The Box is involved in all transmissions of radiant energy. An absorbed photon creates a string (or maybe a cluster) of these Boxes proportional to the frequency of the radiant energy. Radiant energy from different sources and in different strengths differs only in that frequency. Photons may be emitted by a series of Boxes created by mutual annihilation of either pairs of FIMs and GEMMs or pairs of n-ZEPs and p-ZEPs. Boxes are formed from radiant energy on absorption, controlled largely by the absorbing material.

Mass may appear as FIMs and GEMMs or as n-ZEPs and p-ZEPs when radiant energy is absorbed on atomic nuclei. FIMs on the surface of a nucleus may form Boxes with GEMMs and transform to pairs of n-ZEPs and p-ZEPs with no change in energy. As fundamental particles, the compositions of electrons and positrons are not subject to change. Electrons are aggregates of n-ZEPs and positrons are aggregates of p-ZEPs, normal mass without any FIMs. Absorbed radiation is converted directly to thermal or kinetic energy and/or re-emitted as radiant energy.

Close inspection of the A1 and A2 (energy) sides of the Box reveals that the colors rotate in opposite directions, indicating the property of “spin” which appears in the left- or right-hand polarization of radiant energy. These mirror-image qualities must also exist in the pairings of FIMs and GEMMs as well as n-ZEPs and p-ZEPs, but with less obvious effects than in radiation. This “spin” property is obviously related to that of quarks.

ELECTRONS, POSITRONS, AND NEUTRINOS

The structures formed by ZEPs with repulsive charges and equal amounts of positive and negative forces must be stabilized by surrounding the charges with attractive force and covering that surface with repulsive force. This is much like an egg, with attractive force and two charges forming the yolk and repulsive force as the “white”. ZEPs are formed on a nucleon surface from absorbed radiant energy or by combination of FIMs and GEMMs to form Boxes which produce n-ZEPs and p-ZEPS. These accumulate in different areas, with one group at the surface and the other within the host neutron, perhaps determined by “spin”. This charge separation produces the magnetic moments of neutrons and rare anti-neutrons with their opposing surface charges. The observed magnetic
moment of a neutron is that of a negatively-charged particle while that of an anti-neutron is equal and opposite in sign. The separation does not produce an electric dipole because the positive and negative charges have the same center of gravity. There has been no observation of an electric dipole in a neutron⁴,⁵.

In a high – energy neutron, the group of ZEPs at the surface is large enough to be expelled by beta-decay, with a strong preference for electrons over positrons. The opposite charges may then spread over the surface of the host. Aggregation enlarges the egglike structure, creating electrons or positrons containing the components of about $10^{21}$ ZEPs with about 0.05% of the mass of the neutron. The density is much less than that of neutrons and protons, and they may also be considerably malleable in shape. The outer shell of repulsive force on electrons and positrons provides a simple explanation of why they do not “fall” into an oppositely charged nucleus, and why mutual annihilation of an electron and a positron requires considerable kinetic energy.

With sufficient kinetic energy, the collision of an electron and a positron releases the radiant energy of their n-ZEPs and p-ZEPs through Boxes which create gamma photons. About 0.0001% of the individual collisions produce FIMs and GEMMs rather than radiant energy, creating neutrinos.

**RADIATION**

Physics regards Electromagnetic radiation as the transfer of Energy across space as waves. Mathematical representations of waves are based on observations on the behavior of waves in media with finite density rather than in a near - vacuum. The space within and between atoms is considered empty and cannot provide a medium. GEMMs could be providing that medium. Emission of radiation must involve the conversion of mass to Energy and the absorption of radiation must involve the conversion of Energy to mass. All radiation may be described as waves traveling at the same speed in a medium which might contain these tiny

bits of Matter, irrespective of the frequency. The Energy of radiation is related to the frequency rather than the amplitude of the wave, requiring that all radiation has the same Energy associated with a single cycle of the wave. This is the fundamental quantum of Energy represented by Planck's constant and must be some integral multiple of the Energy associated with the smallest possible increment of mass. A radiant body (any visual mass above the absolute zero of temperature) is constantly converting mass to Energy at frequencies determined by the rates of conversion. This Energy travels through space at the speed of light until it encounters Matter, which might absorb some or all of the Energy by converting it back to mass as FIMs and GEMMs or n-ZEPs and p-ZEPs.

The conversion process must be reversible. Ordinary matter composed of FIMs becomes excited by interactions between nuclei and electrons, and within nuclei. Highly active FIMs interact with GEMMs to form quadrupoles/boxes and are transformed into radiant energy. All matter as we know it is continually absorbing and emitting radiant energy gaining and losing FIMs with equal amounts of GEMMs being transferred in the process. The surfaces of nuclei must be covered with a thick “gumbo” of FIMs, GEMMs, free zeptocharges, Force and Antiforce from the interactions with quarks, electrons, other nuclei, and radiation from other sources. This provides a medium and a “temperature” suitable for energy/mass conversion in either direction.

**MAGNETISM**

Magnetism is based on movement of electrical charge, either as a current or as “spin” of charged elementary particles such as electrons. A permanent magnet has a crystal structure such that the spins of a majority of the unpaired electrons (and their magnetic moments) are aligned. Irrespective of whether electron spin is a real or purely mathematical property, their interaction creates a field which interacts energetically with the spinning dipole of surrounding GEMMs. Somehow this magnetic field goes off into the space around it which is usually gas (air) or a near-vacuum but can also be a liquid or solid. This field is powered by the thermal energy within the atoms of the magnet. The energy involved is far less than that involved with loss or gain of mass. An electromagnet creates
a magnetic field powered by the electrical current. These fields are continually being emitted into the medium, spreading out until they either find a medium where they encounter less resistance to flow or their density is diminished. The present concept of a vacuum is not a medium. GEMMs could provide the medium as a physical quantity. The influence of an electric current or electron spin within the magnet could be imparted to GEMMs located within and/or around the atoms of the magnet, spreading and diluting the magnetic field. The field is propagated through many tiny steps and is dissipated and scattered by every step. There is no transfer of mass in creating and maintaining this force. Transmission of the force through a vacuum involves the GEMMs but does not proceed at the speed of light because of resistance due to the spinning masses of the dipoles.

**GRAVITY**

Light, magnetism, and gravity span a vacuum which could be filled with a network of GEMMs. GEMM Theory considers gravity as a combination of the attractive force of FIMs in all visible mass and the repulsive force of the GEMM network. There are shields which can block magnetic force and radiation, but gravitational force is not affected by anything but the presence of other masses and their distance. The force is not affected by the temperature or the density of accumulated mass. Even GEMMs are attracted by other mass but repelled by the antiforce. Like radiation, gravity is everywhere in the Universe. Gravity appears to travel at the speed of light. If so, the gravitational field most likely involves some type of interaction through the network of GEMMs. Radiant energy removes FIMs and GEMMs from space near a mass at one point on emission and produces FIMs and GEMMs by absorption at distant masses. Masses in space maintain fairly constant average temperatures through exchanges of radiation from other masses. Rapid changes in temperature would produce gravitational waves travelling at the speed of light.

There is activity between electrons and nuclei in all atoms with continuous exchange of mass and energy. A much greater amount of energetic activity is probably maintained in the nuclei with extremely short, fast vibrations between compressed FIMs with their charges and attractive
force which comprise the strong Force. These vibrations impact the network of GEMMs, connecting all mass in the Universe.

Radiation from a star transmits energy created from reacting FIMs which make up the star and with GEMMs which permeate the star and its vicinity. This causes a decrease in the concentration of GEMMs in the vicinity of the star, stretching the spacing of the network toward the mass of the star. This is similar to the common depiction of a mass distorting the “fabric of space” to bend passing light toward the star, which has generally been attributed to gravity. The bending effect is more often considered in terms of the effect of gravity in warping the space-time continuum, producing a lensing effect. The increased spacing of the GEMM network toward the star could have the same effect.

The accelerating expansion of the Universe is generally attributed to “Vacuum Energy “or simply “Dark Energy” which diminishes the attractive force of gravity. “Since the 1990s, studies have shown that, assuming the cosmological principle\(^5\), around 68% of the mass–energy density of the universe can be attributed to so-called dark energy.” GEMMs could contribute a substantial amount of that Dark Energy.

**BLACK HOLES**

Black Holes are recognized by their incredible mass and gravity that no visible mass can escape. This effect has been extended to an attraction of radiant energy, supported by the observation of light bending toward the sun. This effect is attributed to the Wave-Particle Duality Principle in which light is considered to magically have properties of both mass and radiant energy. These observations have added to other - world characterizations involving a hole and a singularity where the rules of Physics do not apply. Much of this has been discredited by actual photographs and rational thinkers who recognize that a Black Hole cannot be a hole\(^6\).

GEMM theory recognizes the value of the Duality Principle applied to the transfer of mass and energy as a First Law possibility but does not accept the concept that radiant energy has mass and is affected by gravity.

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\(^5\) [https://en.wikipedia.org/wiki/Cosmological_constant](https://en.wikipedia.org/wiki/Cosmological_constant)

\(^6\) [https://www.sciencefocus.com/space/is-a-black-hole-a-hole/](https://www.sciencefocus.com/space/is-a-black-hole-a-hole/)
The transfer of energy and/or mass from one state to another is independent of path. Calculation of that energy as the kinetic energy of an equivalent mass travelling at the speed of light is valid. The equivalent mass is twice that of the visible mass due to the transfer of an equal amount of anti-mass as predicted by Einstein. Without recognition of this anti-matter, the concept of radiation as moving mass (an alternate manifestation) leads to the assumption that radiant energy is subject to gravity. There is no question that a BH receives radiation from stars and emits little visible radiation, most of this occurring at the Event Horizon. The high frequency X-ray and Gamma radiation that is observed has been attributed to energy from the accretion disk surrounding the body. This could also be due to continued build-up of pressure and compression of the core material. Hawking devised a model of attracted matter and photons forming virtual particles of normal mass with normal energy, and of antimatter with negative energy at the event horizon. The normal mass is ejected and the antimatter is converted to normal matter with negative energy which disappears into the hole. He predicted the emission of radiation from outside the event horizon – Hawking Radiation – which is now associated with the observed low frequency thermal black-body radiation. That radiation reveals an extremely cold body, only a tiny fraction of a degree above the absolute zero of temperature.

GEMM theory considers the BH to be absorbing the radiant energy it receives from the rest of the universe with no special attraction due to gravity. All of the absorbed radiation is transformed to FIMs and GEMMs. The FIMs become part of the growing mass and the repulsive GEMMs are ejected with extreme kinetic energy. The net effect is a gain in mass and density for the BH and a cooling effect of the surface to near the absolute zero of temperature, which is observed as black-body radiation. The BH does not attract radiation, but traps most of the absorbed mass created by the radiation. GEMMs cannot penetrate past the surface to combine with the FIMs in the core neutrons to produce normal radiation, possibly creating a neutron plasma. That pressure is eventually released by the ejection of FIMs into the surrounding atmosphere of GEMMs, producing an occasional burst of radiation similar to a star’s corona. That tremendous
explosion would likely alter the composition and/or the disposition of the accretion disk until it could be re-established.

There are similarities between the two models. The Hawking model involves virtual particles of mass and antimatter, and GEMM theory involves well-defined FIMs and GEMMs. Hawking’s virtual particles each have mass but one has normal energy and the other has negative energy. FIMs and GEMMs both have mass, but one has attractive force and the other has repulsive force. Both models lead to the ejection of one particle and absorption of the other, but the Hawking model ejects normal mass in an undefined form. The ejected GEMMs become part of the Fabric of Space.

GEMMs ejected by Black Holes increase their concentration in the vicinity, compressing the spacing of the network while those consumed by stars decrease the concentration in that area and expand the spacing. This creates a flux of GEMMs outward from a Black Hole to surrounding stars, perhaps explaining observations of a Black Hole near the center of many galaxies. That situation would produce a decreasing concentration of GEMMs outward from the Black Hole near the center of the galaxy, compensating somewhat for the increasing concentration outward from stars.

**Parity**

Parity in the creation of matter and antimatter is handled poorly by science. The invocation of virtual matter, as in “vacuum polarization” and “Hawking Radiation”, must involve parity so that the virtual matter will disappear when it has done its theoretical job in explaining some phenomenon. However, parity isn’t considered for the mass created by radiant energy, unless there is sufficient energy to create an electron and a positron. Electrons and positrons are considered as matter and antimatter on the atomic level with mirror images in the reflection of electric charge. GEMM Theory considers this on the fundamental level with n-ZEPs and p-ZEPs, which are always created in pairs with opposing charge and spin from radiant energy or by combinations of FIMs and GEMMs. FIMs and GEMMs are also paired as matter and antimatter on the fundamental level.
with mirror images in their reflections of positive and negative force as well as spin.

Atomic nuclei are continually receiving radiant energy which is transformed through The Box into pairs of positive/negative forms of force or charge. The positive charge of protons does not allow absorption of mass as n-ZEPs and p-ZEPs, only as FIMs and GEMMs. The surface of a neutron is a liquid-like “gumbo” of FIMs, GEMMs, n-ZEPs, and p-ZEPs. The opposing charges of the ZEPs must be separated with one charge going to the center mass of FIMs and the opposite charge remaining at the surface closer to the GEMMs, retaining the overall neutrality. This separation produces the magnetic moments of neutrons and rare anti-neutrons with their opposing surface charges. The observed magnetic moment of a neutron is that of a negatively-charged particle while that of an anti-neutron is equal and opposite in sign. The separation does not produce an electric dipole because the positive and negative charges have the same center of gravity. There has been no observation of an electric dipole in a neutron.

The separation of charges is sufficient for the concentration of surface ZEPs to build to a point of ejection as an electron or a positron. The natural abundance of electrons over positrons and neutrons over anti-neutrons throughout the known universe may be due to an affinity between p-ZEPs and FIMs (and/or between n-ZEPs and GEMMs). This could be related to a property similar to the “color” of quarks, such that FIMs and p-ZEPs share one color while GEMMs and n-ZEPs share another.

The Brain and Metaphysics

The brain is the hub of action for all of the functional parts of the body, connected through the neural network. Electric impulses travel at speeds up to about 300 mph, transmitting sensory information and controlling activity in muscles and organs. The brain is also the home of memory, processing that information and storing it in brain cells. A thought is a tiny increment of an idea, dream, or memory based on pertinent

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7 https://en.wikipedia.org/wiki/Neutron_magnetic_moment
8 https://en.wikipedia.org/wiki/Neutron_electric_dipole_moment
information supplied to brain cells through the available networks. This information must be collected almost instantaneously from a multitude of sources within the brain and processed at incredible speed in the creation of an idea or the simple collection of a memory. The GEMM network has a spacing comparable to that of atoms in a crystal, permeating all matter except atomic nuclei and possibly electrons. This network transmits and processes information within the brain at or near the speed of light, far beyond the capacity of the neural network. The neural network provides communication and interaction between the brain and the rest of the body. Something like the GEMM network must provide the faster and broader communication within the brain which is required for the more complex thought processes of memory, dreams, ideas, and general mentality.

While the neural network is essentially “hard wiring”, the GEMM network is like Wi-Fi.

There is evidence that a narrow region of near infrared radiation is received and emitted through the skulls of mammals, while shorter and longer wavelengths are not. This is the general region that is probed through the scalp with EEG (electroencephalography). This region separates the activity of the brain into internal interactions with the neural network (longer wavelengths) and with the GEMM network (shorter wavelengths). The narrow “window” of wavelengths transmitted through the skull could enable interaction between the two internal networks of the brain, and external interaction with the rest of the Universe. The skull protects these networks from most of the external radiation and information which would raise their noise levels relative to the signal strength. The narrow window in the near infrared region might allow limited interaction of the brains of mammals (and probably other classes of vertebrates) with the rest of the universe through biological clocks, natural instincts, group knowledge, and other activities.

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9 *Can Light Penetrate the Skull? - Vielight Inc*

10 *Deep in the Red: Using Infrared to Watch What Goes On in a Living Body - Scientific American*
Variation of the range and location of the frequency window between individuals would create wide differences in the mental and physical capabilities between and within species. This could explain the increased range of physical senses and diminished mental capacity of animals relative to humans. Damage to the skull might affect the capabilities of an individual through changes in the window as well as in the brain itself. The window could provide a medium for thought or memory transmissions with other brains ranging from simple extrasensory perception to the Vulcan Mind Meld of Star Trek fame. While the latter is an extreme “stretch” of our understanding of the physical world, it may provide a possible basis for the unexplained acquisition of knowledge and abilities such as the Savant Syndrome at birth or through brain injury. Many religions refer to an “Innate knowledge” of God or of Right vs Wrong, and messages directly from God or emissaries such as angels, fairies, Saints, etc. Concepts such as Atman, Karma, and Soul may relate to memories of lifelong experiences stored as a detailed diary via the GEMM network.