

Resonance Academy Unified Science Course

Index & Links with added Notes

The Resonance Academy Science Foundation is a global non-profit based on Nassim Hamein's Unified Field Theory. The goal is to create a world where humanity's technological and social systems are in harmonious relationship with nature, earth and the cosmos. The Resonance Groups are a community that understand everything is connected and they have the science to prove it, and the tools to experience it.

One of those tools is the Resonance Academy Unified Science Course

<https://www.resonancescience.org/library> This document is an outline of all the course sections with each item also being a link to take you directly to the specific course content page.

There are two versions of this document content. The original lists the section titles along with the accompanying links only. It acts as a quick reference to the material by outlining the content and as a quick navigation mechanism to get to specific information more quickly. The outline numbers correspond to the numbering scheme used in the course e.g., below you will find that outline number 3.5.1 has the title - What Does Quantum Mean? In the Academy's online course, section 3.5.1 is also What Does Quantum Mean? The 2nd version of the content (this document) contains everything from the original plus notes to further describe the section material. This variant can be used as course crib notes. As I include additional notes or the Resonance group adds new information this document will change. The latest version can be downloaded at <http://www.randylangel.com/unified-physics-downloads.html>

This document is available in Microsoft Word format to allow for linking to an open browser signed-on to the Resonance Science Unified Science Course site.

Randy Langel randy.langel@gmail.com 4/4/20

[1 Worldview Shift](#)

[1.1 Introduction](#)

[1.1.1 A Comprehensive Perspective](#)

[1.1.2 What is a Worldview and Why is it Important?](#)

[1.2 Two Worldview Lenses](#)

[1.3 The Disconnected World View](#)

[1.3.1 Scientific Perspective](#)

[1.3.2 The Importance of Shifting our Worldview](#)

[1.3.3 How Did the Disconnected Worldview Arise?](#)

[1.3.4 Consequences of a Disconnected Worldview](#)

[1.4 Shifting our Worldview](#)

[1.4.1 A Natural Evolution of a Society](#)

[1.4.2 Shifting from Disconnected to Connected](#)

[1.4.3 Feedback is Inherent in Cosmic Evolution](#)

[1.5 Roots of Unified Physics & a Connected Worldview](#)

[1.6 Implications of a Connected Worldview](#)

[1.7 Summary](#)

[2 Thinking Differently](#)

[2.1 Introduction](#)

[2.2 The Courage to be Bold](#)

[2.2.1 Revolutions in Thinking](#)

[2.3 Different Thinkers – Roots of Scientific Ideas \(for better or worse\)](#)

[2.3.1 Pythagoras](#)

[2.3.2 Plato](#)

[2.3.3 Euclid](#)

[2.3.4 Hypatia of Alexandria \(circa 370-415 AD\)](#)

[2.3.5 Leonardo Da Vinci \(1452-1519\)](#)

[2.3.6 Nicolaus Copernicus \(1473-1543\)](#)

[2.3.7 Giordano Bruno \(1548-1600\)](#)

[2.3.8 Galileo Galilei \(1564-1642\)](#)

[2.3.9 Johannes Kepler \(1571-1630\)](#)

[2.3.10 Rene Descartes \(1596-1650\)](#)

[2.3.11 Lady Anne Conway \(1631-1679\)](#)

[2.3.12 Isaac Newton \(1642-1727\)](#)

[2.3.13 Nikola Tesla \(1856-1943\)](#)

[2.3.14 Max Planck \(1858-1947\)](#)

[2.3.15 Albert Einstein \(1879-1955\)](#)

[2.3.16 Barbara McClintock \(1902-1992\)](#)

[2.4 Nassim's Personal Reflections on Thinking Differently](#)

[2.5 Principles of Thinking Differently](#)

[2.5.1 Question Everything](#)

- 2.5.2 [Intuitive Knowing](#)
- 2.5.3 [Follow the Breadcrumbs](#)
- 2.5.4 [Confirmations from Nature](#)
- 2.5.5 [The Solution is Always Beautiful](#)
- 2.6 [Changing Course – From 2D Isolation to Holographic Wholeness](#)
- 2.6.1 [Modern Physics – 2D Isolation](#)
- 2.6.2 [Unified Physics – Holographic Wholeness](#)
- 2.7 [Summary](#)

3 [Modern Physics](#)

- 3.1 [Introduction](#)
- 3.2 [Reductionism](#)
 - 3.2.1 [Descartes](#)
 - 3.2.2 [Newton & his Contention to Cartesian Thinking](#)
 - 3.2.3 [A Flat Universe](#)
 - 3.2.4 [Summary](#)
- 3.3 [Closed Systems](#)
 - 3.3.1 [Energy](#)
 - 3.3.2 [The Laws of Thermodynamics](#) Carnot engine cycle
 - 3.3.3 [Entropy](#)
 - 3.3.4 [Summary](#)
- 3.4 [Einstein & the Relativity Revolution](#)
 - 3.4.1 [Light & Special Relativity](#)
 - Photoelectric effect explained in a video
 - Brownian Motion
 - Michelson-Morley experiment
 - A Special Relativity thought experiment by Adam Apollo
 - 3.4.2 [Mass Energy Equivalence](#)
 - 3.4.3 [Gravity & Einstein's General Theory of Relativity](#)
 - Einstein Field Equations
 - 3.4.4 [Black Holes](#)
 - Schwarzschild Radius – Karl Schwarzschild found a solution to Einstein's Field Equations. At a certain radius around the center point of a spherical body, some of the terms in the Einstein field equations become infinite.
 - The Schwarzschild solution essentially shows that if an object is massive enough, it will curve spacetime so that not even light can escape.
 - 3.4.5 [Summary](#)
 - Special Relativity showed us that, regardless of your frame of reference, the speed of light is constant in a vacuum.
 - If the speed of light is constant for all frames of reference, then each observer experiences time and mass differently.
 - The equivalence of mass and energy, although individually undefined, was defined in Einstein's famous equation $E=mc^2$.
 - Space and time are unified in a single phenomenon where gravity is the effect of the curvature of spacetime.

- Einstein's field equations (and the subsequent solution to them by Karl Schwarzschild) introduced a mathematical model for singularities in the vacuum structure of space — what later came to be called black holes — that has both informed and perplexed Modern Physics ever since.

3.5 [Quantum Theory](#)

3.5.1 [What Does Quantum Mean?](#)

3.5.2 [Blackbody Radiation & the Ultraviolet Catastrophe](#)

- Planck Constant

3.5.3 [Planck Units](#)

- How Planck Length, Mass, Force & Time are calculated

3.5.4 [The Birth of Quantum Theory](#)

- Double slit experiment example from MIT

3.5.5 [Copenhagen Interpretation](#)

- Schrodinger's cat
- Double slit experiment with bouncing drops of silicon on a vibrating plate

3.5.6 [Quantum Electrodynamics](#)

- Pauli Exclusion Principle
- Lamb shift
- Mass renormalization & its problems

3.5.7 [Quantum Field Theory – Vacuum Catastrophe](#)

- Vacuum renormalization
- Casimir effect
- EM Drive by Robert Shawyer video
- Universe expanding & Einstein's Cosmological Constant

3.5.8 [Summary](#)

- The work of Max Planck revealed interesting insights into the nature of reality. The idea that light itself could be understood through specific integers, steps of energy, or photons revolutionized physics.
- Max Planck provided the unit or “quantum of action” known as Planck's constant and thus established the fundamental units of the Universe.
- Bohr utilized Planck's constant to establish a new “quantum view” of the atomic model.
- Wave-particle duality brought about a new and very esoteric way of thinking that ultimately led to the Copenhagen Interpretation.
- The relativistic model of quantum mechanics — Quantum electrodynamics — led to the realization of an underlying quantum electrodynamic vacuum.
- The infinities resulting from the calculations of the electrons with the underlying ground state established renormalization.
- Using a renormalization cut-off value of the Planck length, the quantum vacuum fluctuation energy was calculated to be 122 orders of magnitude greater than that found from Cosmologists.
- Hamein resolved the vacuum catastrophe by showing that the quantum vacuum density varies from the radius of a proton to the universal radius.

3.6 [The Standard Model](#)

3.6.1 [Fundamental Questions](#)

- How could these properties emerge from a deeper underlying theory?
- What if energy is acting in particle and wave format simultaneously?
- Could these particles and forces be seen as fluctuations of the vacuum, the fabric of spacetime itself?

3.6.2 [Particles](#)

3.6.3 [The Strong Force](#)

3.6.4 [The Electroweak Interaction](#)

3.6.5 [The Higgs Mechanism & Higgs Boson](#)

3.6.6 [Attempts at Unification](#)

- String Theory
- The Holographic Principle – describes the event horizon of a black hole as being similar to pixels on a computer screen.

3.6.7 [Quantum Gravity](#)

- Loop Quantum Gravity

3.6.8 [Summary](#)

- **Elementary Particles** – In order to better understand protons, they were smashed into each other at high speeds, and detailed pictures emerged of the way the energies inside a proton dispersed and decayed. Different patterns were classified into different subatomic particles and/or families of quarks. Observations of these patterns were used to create elegant theoretical models of all the types of subatomic particles, and energy release and decay patterns were observed in colliding protons, neutrons, and even quarks themselves, that seemingly “confirm” these theoretical models.
- **Virtual Particles** – In order to explain anomalies in the energy levels of apparently “isolated” experiments, the existence of virtual particles that pop in and out of existence were theorized. Eventually these particles and anti-particles were described as being in constant emergence and annihilation of each other.
- **Strong Interaction** – A new force was theorized to explain how atomic nuclei stay together and override the positive charge of protons. A force-carrying particle called a gluon was also theorized which mediates this force. The strong force has incredibly odd properties, such as gargantuan strength with miniscule fall-off distance. The color confinement application of the strong force to quarks, where the force is apparently huge at any distance, is still not understood.
- **Electroweak Interaction** – In order to unify the properties of the decay of particles with the electromagnetic field, two new force-carrying particles were theorized to exist — the W and Z bosons. These bosons have properties unlike any other force carrier, including a mass 100 times greater than a proton, and exist for only about 0.000000000000000000000003 seconds.
- **Higgs Mechanism** – In order to explain the odd properties of the W and Z bosons, as well as explain other mysteries in the Standard Model, the Higgs mechanism and its mediating particle the Higgs boson were proposed to exist. The Higgs mechanism is said to be able to add (or remove) mass in all particles at specific energy levels, and allow force carriers (like the W and Z bosons) to gain huge amounts of mass. A particle with energy levels similar to the theoretical Higgs boson may have been detected by CERN in 2012. The Higgs mechanism may also be interpreted as an alternative approach to Unified Physics, through being a scalar field applied to the vacuum which changes the properties of particles and forces.
- **Supersymmetry** – A type of symmetry between all types of particles would help to explain the properties of the Higgs mechanism, though superpartners required by the theory have never been detected.
- **String Theory** attempts to close the gap on the great divide between quantum mechanics and gravity by introducing a theoretical framework where point like particles are one-dimensional objects called strings. The model attempts to incorporate all known particles as well as gravity. However, although mathematically sound, it has not made any successful predictions.
- **Loop Quantum Gravity** is one of the first working models of quantum gravity. It describes spacetime as a discrete lattice of loops woven in a spin network, and in contrast to the 10 dimensions proposed by string theory,

it only requires the usual 4 dimensions. However, although it attempts to understand the quantum aspects of gravity, it does not explain or give rise to any of the other particles and forces.

3.7 [Summary of Modern Physics](#)

4 [Unified Physics](#)

4.1 [Introduction to Unified Physics](#)

4.1.1 [What is Unified Physics?](#) Topics covered:

- What is spacetime?
- What is behind the cosmological constant, or expansion of the Universe?
- How do we unify quantum mechanics and relativity through quantum gravity?
- How does gravity work at the quantum scale?
- Why is everything spinning?
- How is everything connected?
- What is the geometry of spacetime?

4.1.2 [Big Unsolved Problems in Physics](#)

- **How do we resolve the 122 orders of magnitude difference** between the **Cosmological Constant** (dark energy or vacuum energy at the cosmological scale thought to be responsible for the expansion of our universe) and the **quantum vacuum density** (the energy density at the Planck scale — Planck density)?
- **Why is there inconsistency between quantum forces** (especially the so-called Strong Force that binds protons together in the nucleus of an atom) **and cosmological forces**? Primarily in regards to gravity, which is currently thought of as far too weak at the large scale to address the magnitude of the Strong Force, hence each of them have been seen as having different origins, neither of which is explained.
- **Why the Strong Force drops its magnitude of influence so quickly** as the distance from the surface of a proton increases.
- **What is the source of Mass** (and therefore, Energy, since the two are convertible through Einstein's $E=mc^2$ formula)?
- **What determines the Speed of Light**, the seemingly constant rate of the propagation of electromagnetic energy throughout the universe that relativistic physics deems to be the ultimate “speed limit” of the physical universe?
- **What is the “missing mass-energy” of the universe**, called Dark Matter and Dark Energy, that's currently required to explain large-scale dynamics of galactic structures and the expansion of the universe (which can't be explained through an analysis of the total measurable mass-energy gravitational influences of the observable universe alone)?
- **Why the disparity of the mass of the Planck and the mass of the proton relative to their size** (i.e. the Hierarchy problem between the Planck and the proton and thus gravity).
- **What is the mechanism and the source of energy that produces spin** for both the cosmological scale in the universe and the quantum scale?
- What enables atoms and their constituent components (protons, electrons, etc) to remain **spinning indefinitely with no known cause or explanation** as to why they're not slowing down due to inertia and entropy?

4.1.3 [Holographic Universe](#)

- Holograms

[4.1.4 Fractal Universe](#)

[4.1.5 Black Holes](#)

[4.2 Space](#)

[4.2.1 Modern Unified Theories & Space](#)

[4.2.2 99.9999999999996% Space](#)

[4.2.3 What is Spacetime?](#)

[4.2.4 Dividing Spacetime \(Quantization\)](#)

- Calculating vacuum energy density 10^{93} gms/cm³

[4.2.5 The Density of Spacetime & Holographic Information Storage](#)

- Hierarchy Problem - Why is the Planck so massive and the proton so light
- 10^{55} calculations - the amount of vacuum mass-energy inside a single proton is equal to 10^{55} grams (per proton volume) or equal to the total mass-energy of the observable Universe

[4.2.6 Dark Energy & the Expanding Universe](#)

- Who is this guy?

[4.3 Quantum Gravity](#)

[4.3.1 Resolving the Vacuum Catastrophe](#)

- Solving 122 orders of magnitude difference between the cosmological constant and the quantum vacuum energy density at the Planck scale

[4.3.2 A Quantized Solution for Gravity](#)

- PSU
- Sphere tiling
- Cygnus X-1 black hole (Cosmological calculation) – Number of Plancks inside divided by number of Plancks on surface - fundamental relationship between the information content, in terms of PSUs **inside the volume of a black hole**, and the PSU information **on the surface event horizon**, giving a ratio that when multiplied by the Planck mass (the energy of that ratio), generates the exact mass-energy of the black hole.
- Reconciliation of quantum mechanics with General Relativity by demonstrating that the source of gravitation, which is currently unknown in standard theory, is the electromagnetic vacuum fluctuations of the quantum information network (the curvature of spacetime describes the mechanics but does not identify what spacetime is made of).
- Rubber duck & draining water.

[4.3.3 Gravity at the Quantum Scale](#)

- PSU calculations & holographic mass solution
- Large number probability
- When calculating the gravity of a cosmological black hole, we take its total volume of mass-energy and divide that by its surface (charge radius or event horizon). This tells us how much of an effect the inside information of the object (a relative amount) has on the outside spacetime (the rest of the universe), which is its gravity.
- When calculating the gravity (or mass) of a proton, we invert this and take the outside information on the surface that we perceive (the relative amount), and divide it by the inside volume (the universal or holographic amount). The proton has the special property of having an internal vacuum fluctuation mass-energy equal to the mass of the visible Universe. Therefore, we're taking our perceived view of a single instance of a proton (by the size of its charge radius in Plancks), and dividing it by the internal volume in Plancks (which is a direct holographic reflection of the Universal mass-energy). This allows us to understand its individual mass-energy or gravity in relationship to all other protons in the universe."

[4.3.4 Predicting the Radius of the Proton](#)

[4.3.5 Publishing the Solution & Predictions](#)

- Experimental measures of proton radius agree with Nassim

[4.3.6 Collective Quantum Coherence & the Source of Mass](#)

- Discrete Planck quantities are the source of mass for the atomic nucleus, the combined totality of which makes up 99.99% of the mass of the universe. Keeping in mind that a neutron quickly decays into a proton when free of the

nucleus, Hamein has therefore addressed the fundamental nature of the mass of atoms by deriving the proton rest mass from the holographic considerations of the Planck information.

- This means that everything you see around you — all of nature, the Earth and Sun, even black holes at the center of galaxies — are made of little Planck vacuum oscillators collectively organizing in coherent structures in certain regions of space.
- Rubber ducky in bath analogy -when you pull the plug, a gradient is generated between the air in the drain and the water in the bath because of a difference in density. This results in all the water molecules in the region of the drain to be co-moving in a coherent vortical dynamic that creates an effect which appears to curve the surface of the water and attract the rubber ducky.
- The same kind of density change between air masses in our atmosphere generates gradients and large energy events of co-moving water particles and large electrostatic charges that we call hurricanes and typhoons. In these cases, only a few degrees difference between a cold air mass near the surface of the water and a hot air mass in the atmosphere above it will be enough to generate such large structures as hurricanes carrying roughly 50 million metric tons of water, discharging millions of watts of power through lightning bolts, and even producing jets of antimatter rising from their nuclei into the high vacuum of space.
- Now imagine a gradient that spans 122 orders of magnitude in change of density. As we have seen above, Hamein solves the density discrepancy between the Planck vacuum at the quantum scale and the cosmological vacuum energy (or the so-called dark energy) at the universal scale by demonstrating the difference to be the result of a proton expanding to the size of the universe, thus causing the vacuum density inside the proton to drop to the cosmological vacuum density we observe. If this is correct, Hamein reasons that the gradient between the Planck density at the quantum scale (10^{93}g/cm^3) and the generally measured cosmological density (10^{-29}g/cm^3) is the driving force (just like the gradient in an air mass that drives hurricanes) behind the angular momentum (rotation) of galaxies, stars, planets, particles, subatomic particles and so on.
- All the mass-energy that makes up our reality is the result of a gradient density of information between different scales, generating and animating the structures of our universe. This approach identifies the information network structure that generates gravity and the mass of all atomic nuclei — the source of the mass-energy that makes up matter.

4.4 [The Confining Force](#)

4.4.1 [Introduction](#)

- Schwarzschild Proton Paper - established that if a proton was treated as a black hole, due to the energy density of vacuum fluctuations, the gravitational strength of such an object would be equivalent to the strength of the *strong force* needed to confine protons in the nuclei of atoms. That is, the Schwarzschild solution of a proton (which we just discussed being solved by Hamein with Planck oscillator quanta) calculates its mass-energy and thus gravitational strength as being equivalent to the nuclear confining force, or the so-called *strong force*.
- Scaling Law - describing a relationship between the mass and radius of objects from the Planck scale to the Cosmological scale.
- In the graph, the Schwarzschild mass-energy of a proton falls nicely on the linear progression, whereas the standard mass of the proton (that would be like considering its mass without the energy that generates its force) is the only data point that is completely unaligned with the rest of the objects.

4.4.2 [The Hierarchy Problem](#)

- One of the most significant challenges of modern physics has been to find a comprehensive framework to explain the significant discrepancy between the relatively large Planck mass, the mass of the proton, and the gravitational force.
- More Specifically the problem is the difficulty of incorporating gravity at the quantum level. Yet, Hamein demonstrates that there is a clear holographic information energy relationship between the proton standard mass, the Schwarzschild mass (what he calls the holographic mass), and the Planck mass which is the source information network in the structure of the vacuum from which all these other dynamics emerge
- The fact that the Planck, billions of times smaller than a proton, has such a large mass-energy indicates that gravity at the quantum level is not weak at all, but that the mass of a proton is simply *measured* as being very small. This is because the relationship of the Planck information structure surface-to-volume ratio produces such a small energy event or mass, which we call the rest mass of the proton.
- Hamein defines this surface-to-volume or volume-to-surface Planck ratio as a fundamental ratio in the physics of our universe and utilizes the Greek letter Phi ϕ (often used in physics to designate ratios, and **not to be confused with the golden ratio**) to identify it.

$$\phi = \frac{\eta}{R} = 3.839682 \times 10^{-20}$$

- From Quantum Gravity and the Holographic Mass, this ratio is derived as:

$$\frac{1}{\phi} = \frac{R}{\eta} = 2.604382 \times 10^{19}$$

- — or the inverse —
- “Consequently, ϕ acts as a fundamental constant relating the background Planck vacuum fluctuation field to the cosmological and quantum scale where it may be the source of confinement so that scaling from the proton rest mass to the Planck mass requires a proportional mass-energy conversion of 2ϕ while from the Planck mass to the holographic gravitational mass requires a factor of ϕ ...”
- “The confining force that protons experience in the nuclei of an atom (the “so-called” strong force or strong interaction) is equivalent to the gravitational force energy that two protons would experience if they were tiny black holes attracting each other.”

4.4.3 [The Gravitational Coupling Constant](#)

- The mass of nucleons is a direct consequence of vacuum fluctuations.
- We now understand that the universe IS indeed highly curved and the points in which that high curvature occurs are what we call protons or, if you like, the material world.
- Rubber ducky & water draining demonstrating coherency.

4.4.4 [Energy & Spin of a Proton](#)

- The mass of the proton is the result of the co-moving PSUs.
- Sourcing all the entities making up $E = mc^2$, as none of these terms have been defined or is unknown.

4.4.5 [A Unified View Emerges](#)

- Our holographic, geometric description of the dynamics of spacetime uses a fundamental information bit, what we call a Planck, a spherical unit at the scale of the smallest wavelength of the electromagnetic spectrum.
- All structures in space, from the proton to the cosmological black hole, can be seen as a spinning field of co-moving and oscillating Plancks
- Through simply calculating the ratio relationships between the number of Plancks on the event horizon or charge radius (surface) of any object to the number of Plancks in the volume of the object, we can actually generate a solution to gravitational mass for cosmological objects (equivalent to the Newtonian limit of Einstein field equations, the Schwarzschild solution), and also apply it at the quantum level to extrapolate the standard mass of the proton.
- Now able to predict the proton radius with extreme accuracy
- We can output a gravitational coupling constant for the “strong force,” therefore removing the need for one of the four “fundamental forces” in physics by unifying it with Gravity.
- We have established the angular frequency of the system and the interaction time of the confinement of that force.
- By examining the dynamics and structure of the vacuum energy at the Planck scale, we are now able to identify the source of mass (the proton makes up most of the mass in the universe), compute cosmological gravitation, demonstrate that the strong force is actually gravitation acting at the quantum scale holding the nucleons together with the correct range, and for the first time give an analytical solution to nuclear confinement.
- By using a theoretical model based upon natural (Planck) units and simple geometric relationships, a unified solution emerges that is able to answer the biggest questions in physics today with accuracy and elegance.
- Due to Einstein’s work, it is generally seen as the result of “spacetime curvature,” but no description was available to define spacetime itself and its composition. Now it becomes clear that spacetime is like a sea of discrete, tiny eddies or vortices composed of spherical Planck oscillators spinning coherently into larger structures. These spinning coherent patterns occur simply due to a change in density gradient in the vacuum from universal size to quantum size, and where there are eddies there is curvature or gravitational forces.
- We can now demonstrate that these eddies, composed of co-moving tiny Planck scale spinning oscillators, are the source of mass (the proton) for all matter in the universe.
- Protons themselves, as subatomic particles that make up the nuclei of atoms, stick together because these tiny Planck eddies collectively produce a gravitational force which is extremely strong very close to the charge radius or event horizon of the proton (the strong force), which literally holds the nuclei together — in other words, holding together what we call matter and the universe as a whole.
- So now when we look at $E=mc^2$, we can identify that E and m are the result of vacuum fluctuations and that the speed of light (c) is derived from the Planck vacuum spinning at that velocity at the horizon of the proton.

- The base of reality, what makes up our material world all around us, is becoming clearly defined. Energy and mass are no longer unknown mystical entities, but they are clearly the result of the information vacuum fluctuation dynamics self-organizing at different scales, from the center of galaxies to the center nucleus of an atom. A unified view emerges!

4.4.6 [Gravitational Falloff & the Yukawa Potential](#)

- Explains why the strong force is actually the force of gravity acting at the nucleus level of an atom, and its range so short? Yukawa Potential
- If you move one proton away from another proton only by the incredibly miniscule value of a single Planck length, there is already a reduction in mass of some 28 orders of magnitude (28 zeroes on the mass number). Therefore, the mass and gravitational attraction of the force drops exponentially, in fact *asymptotically* as you move the protons away from each other.
- This provides an analytical classical solution to the strong force — gravity acting at the quantum scale where systems have relativistic velocities or light speed velocities.

4.4.7 [Summary of Haremei's Solutions](#) Holographic Mass approach:

- “These results are derived from first principles and classical considerations alone, with zero free parameters or hidden variables, and extend our generalized holographic solution to generate a complete picture of confinement whether at the quantum scale or the cosmological scale of black holes.”
- Resolves the ~ 122 orders of magnitude discrepancy between the cosmological constant (universal density or dark energy) and the Planck quantum vacuum density
- Describes the cosmological scale gravitational force as a product of discrete Planck quantities making up the structure of spacetime
- Identifies the source of mass for the proton which makes up matter
- Resolves the hierarchy problem between the proton mass, the Planck mass, and the gravitational force
- Finds the gravitational-to-strong force coupling constant
- Identifies the source of energy and mass and the mechanism from which the speed of light is defined in the famous energy mass equivalence equation
- Calculates angular frequency & period of a holographic proton resulting in the interaction time of the strong force
- Demonstrates utilizing special relativity that gravity can behave with the range typically associated with the strong force giving the first analytical solution to confinement and unifying gravity with the quantum world.
- All this is done without any free parameters (arbitrary numerical values) or hidden variables, unlike the Standard Model and the QCD model for confinement which utilize between 18 or 19 free parameters (and 7 more if neutrinos are considered).
- Furthermore, after decades of super-computer analysis and experimental studies (such as at the Large Hadron Collider) there is still no satisfactory solution to confinement or the source of mass for particles.

4.5 [The Connected Universe](#)

4.5.1 [The Holographic Network of Spacetime](#)

- We have demonstrated that the source of the material world emerges from a fundamental field of information memory on the structure of space, where every little Planck vortex oscillator represents a bit of information in the evolution of a universe. Now let's put the pieces together between the cosmological scale and the quantum scale and visualize the structure in which our lives are embedded.

4.5.2 [Entanglement](#)

- When we calculate the rest mass of the proton, we are observing the local frame, which could be described as the effect the single proton has on the rest of the information network of the Universe. When we invert the equation and calculate the holographic mass of the proton, we account for the non-local information network's relationship to each proton through entanglement, where the mass-energy information of the entire Universe is represented holographically across all protons in the network
- Imagine the surface horizon of the proton treated with Haremei's holographic solution, in which each Planck unit on the surface (there are $\sim 10^{40}$ Planck on the surface of one proton) is the termination of a tiny Planck-scale vortex wormhole that is connected to (and thus entangled with) another Planck on another proton's surface. Then imagine that each of the $\sim 10^{40}$ wormhole Planck terminations of one proton is connected to a different proton, like network cables connecting one proton with $\sim 10^{40}$ others in the rest of the universe. Of course, each of these

$\sim 10^{40}$ protons are themselves connected to another $\sim 10^{40}$ protons, which results in $\sim 10^{80}$ connected protons, which is the estimated number of protons in the universe today. A new picture emerges wherein the Planck vacuum structure generates a fractal network of wormholes where the proton volume is an information hub and the surface is the through-put capacity of the hub to communicate with other protons.

- The surface to volume ratio gives the proton's rest mass of approximately 10^{-20} . This is a direct reflection of the limit of information capable of crossing the event horizon or charge radius of the proton.
- From what we learned from Haraein's holographic solution, the mass of the object is the result of the information within the volume ($\sim 10^{60}$ Plancks in each proton) communicating across the boundary through $\sim 10^{40}$ connections to all other protons. The difference between the two, what Haraein describes as a fundamental universal ratio (which he defines with the greek-letter most commonly used for physical ratios, phi ϕ) is the mass-energy-information of the Planck Spherical Units inside that do not have access to a Planck wormhole termination on the

$$\phi = \frac{\eta_{(surface)}}{R_{(volume)}} \approx \sim 10^{-20}$$

surface, adding up to the rest mass of the proton ($\sim 10^{-20}$):

- In simple terms, there is a larger number of Plancks in the volume than the number of Planck wormhole terminations on the surface, thus only a certain amount of information-energy remains expressed locally and that amount of information-energy happens to equal the mass of the proton.
- PSUs 10^{40} connections through the surface.

4.5.3 [The Universe is a Black Hole](#)

4.5.4 [Experiencing the Unified Network](#)

4.5.5 [Fundamental Harmonics of the Planck Scale](#)

- From the holographic mass analysis and the unified physics network concept, very specific fundamental relationships become apparent.
- There are $\sim 10^{40}$ Plancks on the surface of a proton. Interestingly, the difference between the radius of the universe of $\sim 10^{27}$ to $\sim 10^{28}$ cm and the radius of the proton at $\sim 10^{-13}$ cm also turns out to be $\sim 10^{40}$ to $\sim 10^{41}$ ($10^{27}/10^{-13}=10^{40}$).
- There seems to be a strong correlation between the micro world of the proton and universal scale structures and forces that seem to be defined in the large number of 10^{40} . This may in fact be a result of the fundamental ratio found through Haraein's equations (for which he uses the greek letter Phi ϕ).
- The scaling from the Planck mass $\sim 10^{-5}$ g to the proton rest mass $\sim 10^{-24}$ g or Haraein's fundamental ratio PHI: $1/\phi \approx 10^{20}$
- The scaling between the proton rest mass $\sim 10^{-24}$ g and its Schwarzschild holographic mass $\sim 10^{14}$ g which is $\sim 10^{38}$ or the number of Planck on the surface of a proton $\sim 10^{40}$,
- The $\sim 10^{40}$ scaling between the holographic mass of the proton $\sim 10^{14}$ g and the mass of the universe $\sim 10^{55}$ g which is the mass resulting from the number of Plancks inside the volume of the proton $\sim 10^{60}$,
- The scaling from the rest mass of the proton $\sim 10^{-24}$ g to the mass of the universe $\sim 10^{55}$ g or the number of protons in the universe $\sim 10^{80}$,
- The scaling between the Planck mass and the proton rest mass multiplied by the number of protons in the universe or the number of Plancks in the volume of a proton multiplied by the number of Plancks on the surface of the proton $\sim 10^{100}$,
- The number of Plancks on the surfaces of a proton $\sim 10^{40}$ multiplied by the number of protons in the universe $\sim 10^{80}$ equals $\sim 10^{120}$ which is the number of Plancks on the surface of the horizon of our universe as well,
- The number of Plancks inside one proton $\sim 10^{60}$ multiplied by the number of protons in the universe $\sim 10^{80}$ equaling $\sim 10^{140}$
- the number of Planck in the volume of our universe $\sim 10^{180}$ and so on...

4.5.6 [The Large Number Hypothesis](#)

4.5.7 [Cosmogogenesis](#)

- The probability of our world existing today under random functions is extremely low to non-existent. Yet with feedback in a connected holographic structure, evolution would occur very rapidly as systems are updating evolutionary paths from the environmental feedback across scales. Self-organization, in that case, is not only inevitable but fundamental to the system. With this in mind, we can now regard the universal network system as a *learning* structure in which each point is learning from the whole, and in turn, the whole is informing each point. In such an information web which notably resembles the neuronal structure of the brain, the system's evolutionary learning process must be recorded as a memory input in the structure of spacetime, and therefore the holographic surface which is recording the information, must expand.

- In other words, the expansion of the universe could be directly related to the evolution of a self-organizing holographic surface which is necessary to accommodate its learning. This leads to a continuous creation model of the universe, instead of the typical one shot big-bang.

4.5.8 [Continuous Creation Model](#)

- The continuous creation model proposes that as the universe expands, new matter is created in order to maintain the same average matter-energy density at the universal scale.
- The model predicts that as the universe grew from a proton size to the universal size, it recorded the information of the evolution during the expansion on the structure of spacetime/spacememory as these holographic Planck vortices agglomerations we call protons. As we saw earlier, this expansion model accurately predicts the vacuum density (dark energy or cosmological constant) present at the cosmological scale. This generated all matter creation as a result. In this sense, if the Planck was thought as the bit information on a hard drive of spacetime, then the proton is like the sector of a hard drive, which typically encodes 512 bits of information. Of course, in the case of the proton, the number of Planck bits is astronomical.
- But why would one proton expand in the first place? Protons all around us don't appear to be inflating to universal size. In fact, the proton is extremely stable and has not been seen to decay. What would make a proton suddenly expand extremely rapidly to the size of our universe? The key to this answer is to realize, as we have seen previously, that the values of information-energy in our universe are precisely scaled so that the internal pressure of all of the Plancks within a proton are balanced by the external pressure of all of the Plancks in our universe (the cosmological constant) and the holographic mass interacts such that our universe is a stable steady-state structure.
- Now consider Einstein's steady-state universe approach, and imagine a proton that would escape the horizon of our universe through the wormhole network structure of galactic centers, supercluster centers, and eventually our universal center. As this proton arrives in a larger universe in which our universe lives, it would find a much lower vacuum energy density due to the larger volume of that universe. The vacuum energy density within the proton would suddenly be able to inflate extremely rapidly, and come to stabilize again around the radius of our current universe, creating a sister bubble universe beside our own. It may be that not only our universe has emerged from another as a seed proton and inflated to the current size we observe today, but as well, that there is a continuous creation process of universes frothing out of the boundaries of others and duplicating themselves very much like cells rapidly duplicating themselves to eventually make the 100 trillion cells which makes up a human being from one initial seed.
- With this picture in mind, universal cosmogenesis suddenly resembles an organic or even biological system much more than an inert structure flying apart as a result of some big bang explosion (the source of which is not given). Understanding this process of matter creation within our universe, which is most likely occurring at the event horizon of cosmological black holes where the vacuum structure is highly curved and twisted into vortices of proton size and where information is holographically encoded across all scales in a feedback/feedforward loops, gives us a glimpse of a living universe from which the structure of space organizes to eventually generate biological entities and eventually the feedback of self-awareness or consciousness.
- Consider that you are part of that feedback and that you are embedded in this wormhole network structure from which you actually extract information — your thoughts or your consciousness — and you are feeding back information through your actions. As we have seen, every proton that you are made of is a hub in a wormhole information network that connects you to all other protons and scales in the universe. Unified Physics is about much more than simply giving the correct answers for masses or gravitational fields. Understanding the source of mass and gravitational fields catalyzes one to experience oneself as part of a unified universal evolution. From cosmogenesis to today's events, the universe has been growing and evolving, bringing you to this specific moment. Understanding how you got here through the holographic geometry of this information network is critical to awakening your full potential.

4.6 [Geometry & Spin](#)

4.6.1 [The Torus](#)

- We discussed the quantum vacuum energy as described by Wheeler as extremely dynamic wormhole fluctuations. And in recent times a variety of physicists described the entanglement of particles as a result of wormhole connections at the *planckian* scale. Combined with our generalized holographic mass solution, this leads to a subatomic planckian wormhole information network that is the source of fundamental forces and mass-energy and the self-organizing tendencies of organized matter. Yet, as we have seen, the equations definitely demonstrate that spin is inherent within the vacuum energy gradients of the vacuum structure. One can visualize these Planck wormhole tubes, then, as very high velocity vortices in the structure of spacetime.

4.6.2 [The Origin of Spin](#)

4.6.3 [The Geometry of Spacetime](#)

- Tiling of PSUs & the flower of life pattern

4.7 [Summary](#)

- Nassim Hameiri's model of unified physics proposes for the first time a theoretical framework which addresses not only the outstanding big problems in physics, but also offers a simple solution to the unification of forces across quantum to cosmological scales
- We hope that you will ultimately see the underlying simplicity that this model of physics is based upon, and come to perceive the beautiful elegance with which the cosmos forms all matter, energy and information into a fractally harmonized and holographically synchronized unified whole.

5 [Ancient Origins](#)

5.1 [Patterns, Symbols & Buckminster Fuller](#)

5.1.1 [Cosmic Patterns & Ancient Origins](#)

5.1.2 [Buckminster Fuller](#)

5.1.3 [Pattern Integrity & Fractal Structures](#) Key concepts from Fuller used in unified physics;

- the **Triangle** as the most basic unit of all structure, and the **Tetrahedron** as the most basic system of energy dynamics;
- the **Isotropic Vector Matrix** as an underlying cosmic energy lattice and ultimate “source” of all localized pattern and structure;
- the **Vector Equilibrium** as the conceptual “zerophase” of all energetic systems;
- the “**Closest-packing of Spheres**” that inherently constructs these energetic forms;
- and the **dynamic “jitterbug” pulsation** of the Vector Equilibrium that creates all primary (platonic) forms and spiral vortex flow dynamics.

5.2 [The Tetrahedral Structure of Space](#)

5.2.1 [Fuller's Tangential Sphere-Packing Model](#) characteristics of sphere packing for unified physics;

- Triangulation and Hexagonal symmetry (packing in a 2D plane)
- Vector Equilibrium symmetry (packing in 3D space)
- Isotropic Vector Matrix (infinite radial array) - Connecting the centers of all the spheres creates an array of vectors that are all of equal length and angular relationship with each other (60°), which is called an Isotropic Vector Matrix (IVM).

5.2.2 [The Tetrahedron & Teotihuacan](#)

5.2.3 [Tetrahedron Matrix](#)

- Vector Equilibrium
- Fractal equilibrium
- 64 tetrahedron grid

- 5.3 [All-Space Sphere Packing](#)
 - 5.3.1 [Haramain's Overlapping Sphere-Packing](#)
 - 5.3.2 [Combining Spheres & the 64 Tetrahedron Matrix](#)
 - 5.3.3 [PSU Tiling & the Flower of Life](#)
- 5.4 [Signs from Ancient Times](#)
 - 5.4.1 [Controversy at Abydos](#)
 - 5.4.2 [Cultural Synergy](#)
 - 5.4.3 [The Chinese Connection](#)
 - 5.4.4 [I Ching & Taijitsu Symbology](#)
 - 5.4.5 [Continuing our Journey](#)
 - 5.4.6 [The Face & Name of God](#)
 - 5.4.7 [Kabbalistic Tradition](#) Tree of life
 - 5.4.8 [Pythagoras, Egyptians & the Tetragrammaton](#)
- 5.5 [Journey of the Ark](#)
 - 5.5.1 [The Ark & the Bible](#)
 - 5.5.2 [Box within Boxes](#)
 - 5.5.3 [Gravity Control](#)
 - 5.5.4 [Evidence of Gravity Control in Egypt](#)
 - 5.5.5 [Codes Through the Ages](#)
 - 5.5.6 [Newton's Ancient Sources](#)
 - 5.5.7 [The Order of the Knights Templar](#)
 - 5.5.8 [The Ark in Ethiopia](#)
 - 5.5.9 [The Templars in Europe](#)
 - 5.5.10 [Ancient Origins in Modern Times](#)
- 5.6 [Summary](#)

6 [Implications & Applications](#)

- 6.1 [Energy Generation & Gravity Control](#)
 - 6.1.1 [Quantum Vacuum Engineering](#)
 - 6.1.2 [Isolated Systems & Their Impact on Society](#)
 - 6.1.3 [Overunity Energy Generation & Gravitational Modulation](#)
 - 6.1.4 [Civilization's Graduation from Type 0 to Type 1 or More](#)
 - 6.1.5 [The EMDrive](#)
 - 6.1.6 [Engineering the Spacetime Vacuum](#)
 - 6.1.7 [Ladies & Gentlemen, Spin up your Drives](#)
 - 6.1.8 [The So-Called Tajmar Effect](#)
- 6.2 [ARK Crystal](#)
- 6.3 [Biology & Awareness](#)
 - 6.3.1 [On the Unified Physics of Biology & Awareness](#)
 - 6.3.2 [Cellular & Molecular Information Processes](#)
 - 6.3.3 [The Cellular Membrane](#)
 - 6.3.4 [The Deep Dive: Cubic Membranes](#)

- 6.3.5 [The Cytoskeleton](#)
- 6.3.6 [Mitochondria & Electromagnetic Signaling](#)
- 6.3.7 [The Ubiquitous Presence of Awareness](#)
- 6.3.8 [Summary](#)
- 6.4 [The Bright Future of Humanity](#)
 - 6.4.1 [Ecological Restoration](#)
 - 6.4.2 [Planetary Terraforming](#)
 - 6.4.3 [Traveling Through Wormholes](#)
 - 6.4.4 [Humanity's Interstellar Future](#)
- 6.5 [Summary & Course Completion](#)