Advanced Geometric Physics Solutions

by Mark Rohrbaugh for http://fractalU.com

BSEE - minor in solid-state physics - University of Cincinnati
MSEE - Southern Methodist University

Course Description

- In this course we will be reviewing solutions to advanced physics problems using Nassim Haramein's work, Dan Winter's equations, and showing the simplicity of the approach. Using a basic geometric and information theory approach, assuming a constant density of the vacuum, we will solve for the black hole mass-radius relationship, the proton mass, the proton radius puzzle, and present a few new precise equations for the proton to electron mass ratio and Avogadro's constant, and examine some of Winter's phi ratio and Planck unit discoveries.

- We will relate this to sacred geometry and Dan Winter's phi ratio discoveries and discuss the importance of this material and the implications to this new way of thinking about the vacuum – the fabric of space-time.

Outline

1. Vacuum energy
    1. Haramein's PSU
        1. Link to sacred geometry and Dan Winter's phi ratio equation
    2. Density of the vacuum
    3. Ether – superfluid
    4. Implications
        1. Connectedness

2. What is mass?
    1. Richard Feynman's comments
    2. Importance
        1. CERN LHC IS attempting to answer with Higgs bozon

3. What problems can be solved using this approach?
    1. Black hole mass, radius
    2. Proton mass, radius
    3. Proton radius puzzle
    4. Dan Winter's ionized hydrogen radius equation
    5. Proton to electron mass ratio – precise equation
        1. How this supports Haramein's proton radius prediction
        2. Relates 6 fundamental constants
    6. Avogadro's constant

4. Summary
    1. Implications of this approach
    2. Different way of thinking
    3. New worldview

Vacuum Energy

Planck Units:

Planck Mass: $m_\ell = \sqrt{\dfrac{\hbar c}{G}}$
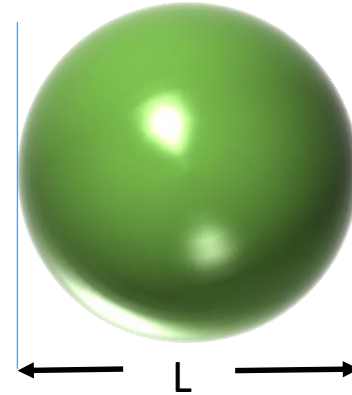
Planck Length: $\ell = \sqrt{\dfrac{\hbar G}{c^3}}$

Haramein's PSU: Sphere of diameter L where L is Planck Length. Therefore, radius $r = \dfrac{L}{2}$

L

- Density of the vacuum of space (space-time)
  - Density is mass per volume
    - $D = \dfrac{M}{V}$ where M is mass, V is volume
  - Use Planck Mass for $M = m_\ell$
    - $M = m_\ell = \sqrt{\dfrac{\hbar c}{G}}$, ℏ is the reduced Planck's constant $\hbar = \dfrac{h}{2\pi}$, c is speed of light, G is universal gravitational constant
  - Use PSU (Planck Spherical Unit) for Volume
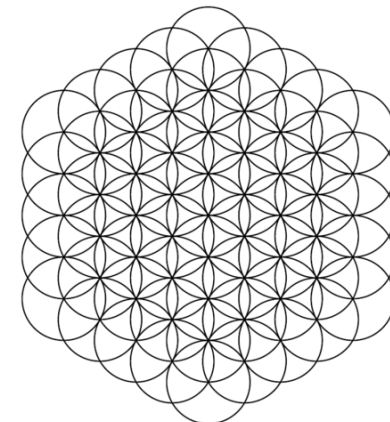   - $V = V_{\ell s} = \dfrac{4}{3}\pi r^3$

$D_{vacuum} = \dfrac{m_\ell}{V_{\ell s}}$

m_ℓ = Planck Mass
$V_{\ell s}$ = Volume PSU

- $D = \dfrac{M}{V} = \dfrac{6}{\pi}\dfrac{M}{L^3} = 9.84568467 \times 10^{96}$ kg/m³
- Google Calculator Link

$\ell = L = Planck\ Length$

Vacuum Energy, Continued

- Aether*, bio-crystalline superfluid fabric of space-time

- 1cc is 38 orders of magnitude more mass than the mass of the entire observable universe (10^{53} kg, [Wikilink](#))

- Implies there is WAY more mass in "space" than that required for creation of black holes and wormholes

- We are already wormhole connected!!!

- Space (space-time) may be full of microtubule wormholes

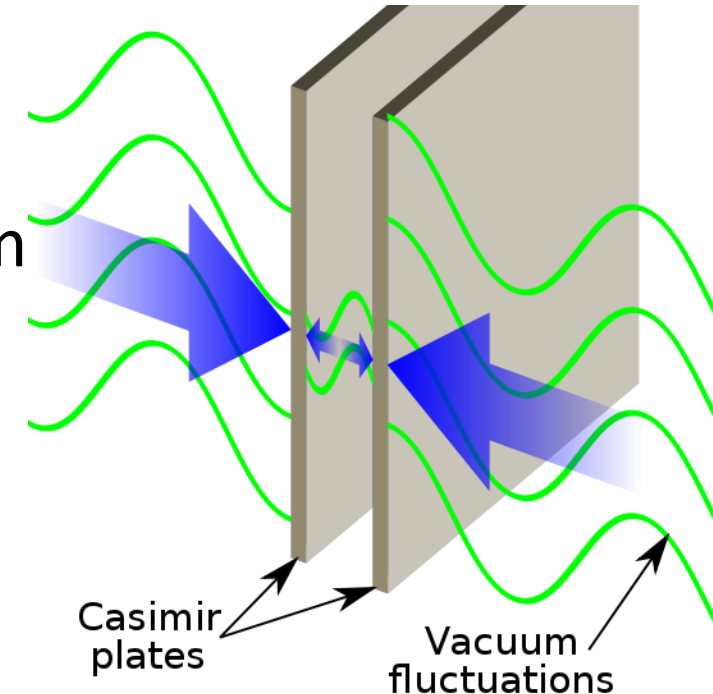- From this assumption, answers to physics questions can be derived

Casimir Effect and Dynamical Casimir Effect (Supports existence of vacuum energy)

- Metal plates block outside waves, net inward pushing on plates

- Experimental proof
  - Vacuum fluctuation energy exists!

- Microwave RF photons can be vibrated out of vacuum

"A rapidly moving mirror that turns virtual photons into real ones is the first experimental evidence of the dynamical Casimir effect."
From:
http://www.technologyreview.com/view/424111/first-observation-of-the-dynamical-casimir-effect/

Casimir plates

Vacuum fluctuations

"Casimir plates" by Emok - Own work. Licensed under CC BY-SA 3.0 via Commons - https://commons.wikimedia.org/wiki/File:Casimir_plates.svg#/media/File:Casimir_plates.svg

Link to Sacred Geometry and the Phi Ratio

Φ = 1.61803398875

- Tetrahedron is fundamental building block

- Platonic solids

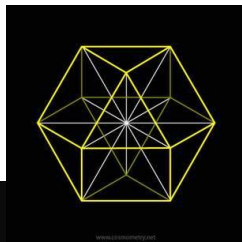- Phi ratio in nature due to the natural growth – building of structure
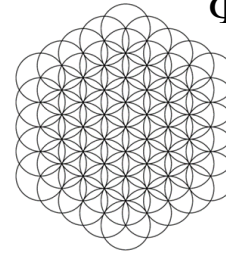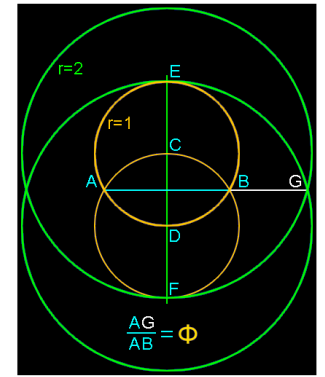
This construction was developed by Kurt Hofstetter in 2002 and published in Forum Geometricorum, Volume 2 (2002) 65-66.

$$\frac{AG}{AB} = \Phi$$

Cartesian coordinates

Figure	Tetrahedron		Octahedron	Cube	Icosahedron		Dodecahedron	
Vertices	4		6 (2×3)	8	12 (4×3)		20 (8+4×3)	
Orientation set	1	2			1	2	1	2
Coordinates	(1,1,1)	(-1,-1,-1)		(±1, ±1, ±1)			(±1, ±1, ±1)	(±1, ±1, ±1)
	(1,−1,−1)	(-1,1,1)	(±1, 0, 0)		(0, ±1, ±φ)	(0, ±φ, ±1)	(0, ±1/φ, ±φ)	(0, ±φ, ±1/φ)
	(−1,1,−1)	(1,-1,1)	(0, ±1, 0)		(±1, ±φ, 0)	(±φ, ±1, 0)	(±1/φ, ±φ, 0)	(±φ, ±1/φ, 0)
	(−1,−1,1)	(1,1,-1)	(0, 0, ±1)		(±φ, 0, ±1)	(±1, 0, ±φ)	(±φ, 0, ±1/φ)	(±1/φ, 0, ±φ)
Image								

from: https://en.wikipedia.org/wiki/Platonic_solid

Phi, φ, the golden ration, $\frac{1+\sqrt{5}}{2}$ is found in relating the Cartesian coordinates of the Platonic solids. Dan Winter's equation: $= \ell \times \varphi^n$ has been found to fit many natural phenomena and relationships. In large part this is due to the IVM, (Isotropic Vector Matrix) nature of the fabric of space-time. The IVM is the only matrix that allows for and equal and opposite force. *L, ℓ is the Planck Length.*

Link to Sacred Geometry and the Phi Ratio, continued

- $Orbital\ Year = Planck\_time \times Golden\_Ratio^{N}$
  - $Year_{orbit} \cong t_{\ell} \times \varphi^{N}$
  - Venus Year, $N = 240$
  - 365.25 days (Earth year) divided by PHI gives the days cycle of Venus (225.7).
- Wavelength of Light for Photosynthesis
  - $\lambda = \ell \times \varphi^{N}$
    - ℓ=Planck length
    - Violet (λ=427nm)
      - N=136
    - Green ($\lambda \cong$550nm)
      - Non-integer N$\cong$136.5
    - Red (λ=691nm)
      - N=137

Planck Units:

Planck Mass: $m_{\ell} = \sqrt{\dfrac{\hbar c}{G}}$

Planck Length: $\ell = \sqrt{\dfrac{\hbar G}{c^3}}$

Planck Time: $t_p = \sqrt{\dfrac{\hbar G}{c^5}}$

planck length * (phi^136) =
427.387485 nanometers

planck length * (phi^136.5) =
543.645279 nanometers

planck length * (phi^137) =
691.527477 nanometers

Photosynthetically Useful Radiation.

A graph of the rate of Photosynthesis and its relationship with different wavelengths of light indicates shows that the middle region of the visible light spectrum is of the least importance as far as photosynthesis is concerned.

PHASE CONJUGATION -Golden Ratio times PLANCK LENGTH

predicts CHARGE DISTRIBUTION EFFICIENCY

THEREFORE LIFE

discussion
fractalfield.com/fractalphotosynthesis

90 Degree Photon- Opposite to Conjugate

Green- Opposite to LIFE & Photo Synthesis

427 nm Planck times PHI^136

691 nm Planck times PHI^137

Photosynthesis Rate (%)

Wavelength (nm)

What is Mass?

- This is the main question CERN LHC is attempting to answer with the Higgs boson.
- Richard Feynman's quotes: [WikiLink](#)
  - "You can't say A is made of B
    or vice versa.
    All mass is interaction."
  - "… why are the masses of the various particles such as quarks what they are? All these numbers … have no explanations in these string theories – absolutely none!..."
  - paraphrased: …someday, possibly, equations will be found for these masses, in simple fundamental physical constants and geometric ratios…
  - Know how to solve every problem man has solved
    - Impossible to read all scientific publications, How to keep up?
    - Focus on unsolved physics problems: https://en.wikipedia.org/wiki/List_of_unsolved_problems_in_physics
- Mass is information, a vibration in and through the fabric of space-time
- Planck Units:
  - Planck Mass: $m_\ell = \sqrt{\dfrac{\hbar c}{G}}$
  - Planck Length: $\ell = \sqrt{\dfrac{\hbar G}{c^3}}$
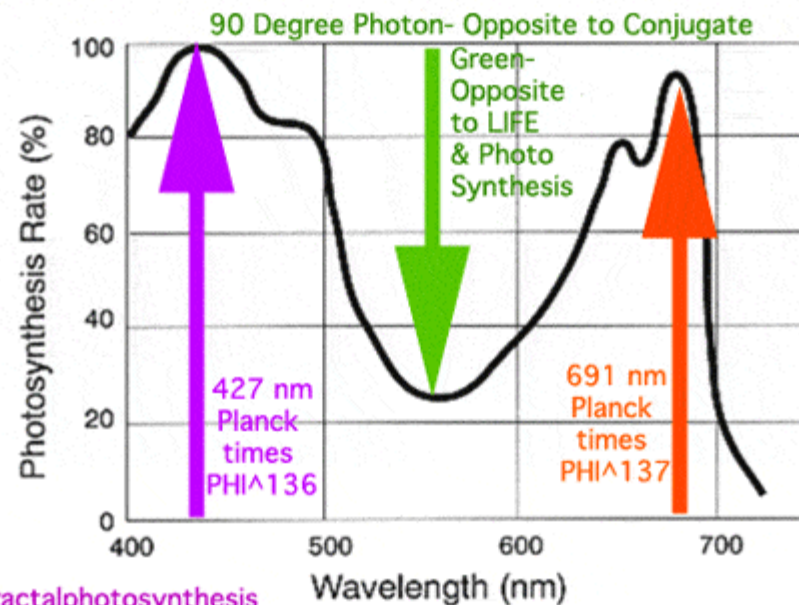 - Planck Time: $t_p = \sqrt{\dfrac{\hbar G}{c^5}}$

What is Mass? , continued

- The importance is: understanding mass gives us more of an idea of the behavior of nature.

- It also presents a way to think about how matter and energy in space behave:
  - Black-(w)hole dual-toroidal space-time dynamics
    - While this is out of the scope of this lecture, it is worthwhile to investigate further
- Ordinarily, $Mass = Density \times Volume$
  - Example: How much mass is 1 liter of water? (at 3.98°C)
    - $1\ liter \times \frac{1000ml}{liter} \times \frac{1gram}{ml} = 1000grams = 1kg$

What problems can we address with the Holographic approach of Haramein?

- Black hole mass, m_s:
  - $m_s = \dfrac{R}{\boldsymbol{\eta}} m_\ell$
    - $R = \dfrac{V}{V_{\ell s}}$ ← large number ratio!
      - V is the volume of the black hole in question
      - $V_{\ell s}$ is the volume of the PSU (Planck Spherical Unit), $V_{sphere} = \dfrac{4}{3}\pi r^3$
    - $\eta = \dfrac{A}{A_{\ell c}}$ ← large number ratio!
      - A is the surface area of the black hole, $A_{surface} = 4\pi r_s^2$
      - $A_{\ell c}$ is the equatorial cross-sectional area of the PSU $(A_{circle} = \pi r^2)$
  - $Rm_\ell = \dfrac{V}{V_{\ell s}} m_\ell = V \dfrac{m_\ell}{V_{\ell s}}$
    - note, this part of the black hole mass equation is volume times our previously defined density of the vacuum!
- The eta term, $\boldsymbol{\eta}$, is the black hole holographic information theory part
  - Holographic principle says information is stored on the 2D surface area of a black hole
  - Susskind wins 25 year battle with Hawking over information not being lost in black holes

$$A_{\ell c} = \pi r^2$$

$$r = \dfrac{L}{2}$$

L
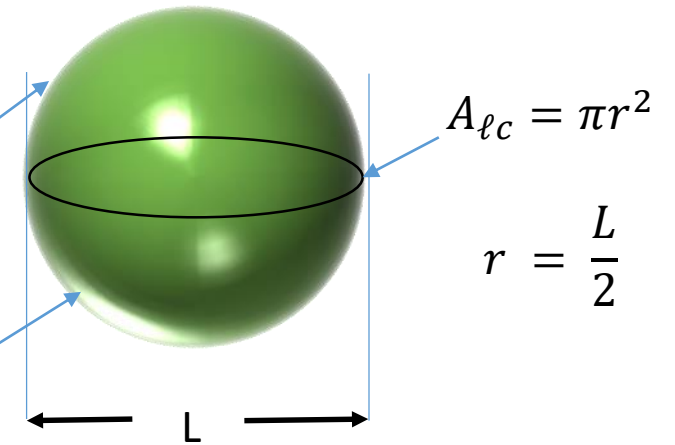
$$mass = volume \times density$$

Black Hole Mass, m_s:

- Black hole mass, m_s:

  - $m_s = \dfrac{R}{\eta} m_\ell$

  - $= \dfrac{\dfrac{\frac{4}{3}\pi r_s^3}{\frac{4}{3}\pi\left(\frac{\ell}{2}\right)^3} \times \sqrt{\dfrac{\hbar c}{G}}}{\dfrac{4\pi r_s^2}{\pi\left(\frac{\ell}{2}\right)^2}}$

  - Using Planck length, $\ell = \sqrt{\dfrac{\hbar G}{c^3}}$ and simplifying:

  - $m_s = \dfrac{r_s c^2}{2G}$

    - which is the same as the Schwarzschild solution to Einstein's field Equations for a black hole[1]!

  $[1]:\ r_s = \dfrac{2Gm_s}{c^2}$, https://en.wikipedia.org/wiki/Schwarzschild_radius

Black Hole Mass Calculation Comments

- Geometric argument:
  - $density \times volume \div information\_theory\_factor$
  - Similar to weighing bottle of water in the ocean vs. out of ocean
    - 1 liter water + 1 gram plastic bottle = 1001 grams out of water, 1 gram in water
- Information theory argument is surface area related as expected
  - Holographic principle relates mass information to 2D surface area on black hole
- Way simpler approach than Einstein's Field Equations (General Relativity), yet gives same answer
- Note: analogies fall apart quickly so focus on phenomena not analogy

Proton Mass (and Radius)

- Proton mass, m_p:

- $m_p = \dfrac{2\eta}{R} m_\ell$ ← geometric form

  - $R = \dfrac{V_p}{V_{\ell s}}$ ← large number ratio!

    $V_{sphere} = \dfrac{4}{3}\pi r^3$

    - V_p is the volume of the proton
    - $V_{\ell s}$ is the volume of the PSU (Planck Spherical Unit)

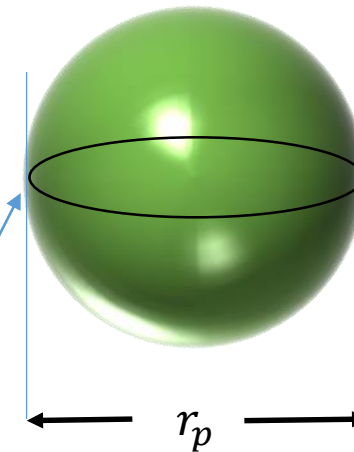 - $\eta = \dfrac{A_p}{A_{\ell c}}$ ← large number ratio!

    - A_p is the surface area of the proton, $A_p = 4\pi r_p^2$
    - $A_{\ell c}$ is the equatorial cross-sectional area of the PSU, ($A_{circle} = \pi r^2$)
    - The eta term, η, is the holographic information theory part
    - Holographic principle is also applied to the proton

r_p

Proton Mass (and Radius), continued

Planck Mass: $m_\ell = \sqrt{\frac{\hbar c}{G}}$

Planck Length: $\ell = \sqrt{\frac{\hbar G}{c^3}}$

Planck Time: $t_p = \sqrt{\frac{\hbar G}{c^5}}$

- Proton mass, m_p, substitute in same geometric and information theory equations and simply to get algebraic form

- $m_p r_p = 4\ell m_\ell$ ← algebraic form

- $\frac{m_\ell}{m_p} = \frac{r_p}{4\ell}$

  - Left side is measured, ratio of known constants
  - REQUIRES $r_p = 0.841236 fm$ which is the disputed muonic hydrogen radius of the 2010 & 2013 measurements.

- This prediction alone indicates the success of Haramein's approach

- μ, the new proton-electron mass ratio additionally supports the accuracy of the proton radius prediction

Proton Radius Puzzle and Mass Comments

- Similar approach to calculating black hole mass
- The proton mass is a dynamic energetic vibration in the vacuum
  - Proton information is exchanged with the immense density of the vacuum
  - Proton essentially blinks into and out of the vacuum at a Planck time rate
  - The electron completes and feeds the proton and balances the torque/spin
    - $m_p r_p = r_e m_e$
    - We will develop this relationship further to examine the key proton to electron mass ratio
- These ideas are still being developed as an extension to the existing physics – it's just the beginning and results and new relationships are being obtained

Proton to Electron Mass Ratio, New Equation!

- $\boldsymbol{\mu} = \dfrac{\boldsymbol{m_p}}{\boldsymbol{m_e}} = \dfrac{\boldsymbol{\alpha^2}}{\boldsymbol{\pi r_p R_H}} = \mathbf{1836.15267}\,\dots$
  - $\alpha = fine\ structure\ constant$
  - $R_H = Rydberg\ constant$
    - symbol R_∞ for heavy atoms or R_H for hydrogen
- Derived using:
  - $m_p r_p = 4\ell m_\ell$
    - Haramein's equation
  - $m_e = \dfrac{2 R_H h}{c \alpha^2}$
    - https://en.wikipedia.org/wiki/Electron_rest_mass
- Originally derived using Schrödinger's equation circa 1990 by M. Rohrbaugh
  - Needed more accurate new value for proton radius measurement

$$\alpha = \frac{1}{4\pi\varepsilon_0}\frac{e^2}{\hbar c} = \frac{\mu_0}{4\pi}\frac{e^2 c}{\hbar} = \frac{k_e e^2}{\hbar c} = \frac{c\mu_0}{2 R_K}$$

Where:
- e is the elementary charge;
- $\hbar = h/2\pi$ is the reduced Planck constant;
- c is the speed of light in vacuum;
- ε_0 is the electric constant or permittivity of free space;
- μ_0 is the magnetic constant or permeability of free space;
- k_e is the Coulomb constant;
- R_K is the von Klitzing constant.

From: https://en.wikipedia.org/wiki/Fine-structure_constant

Proton to Electron Mass Ratio Supports Haramein's Solution IS Correct!!!
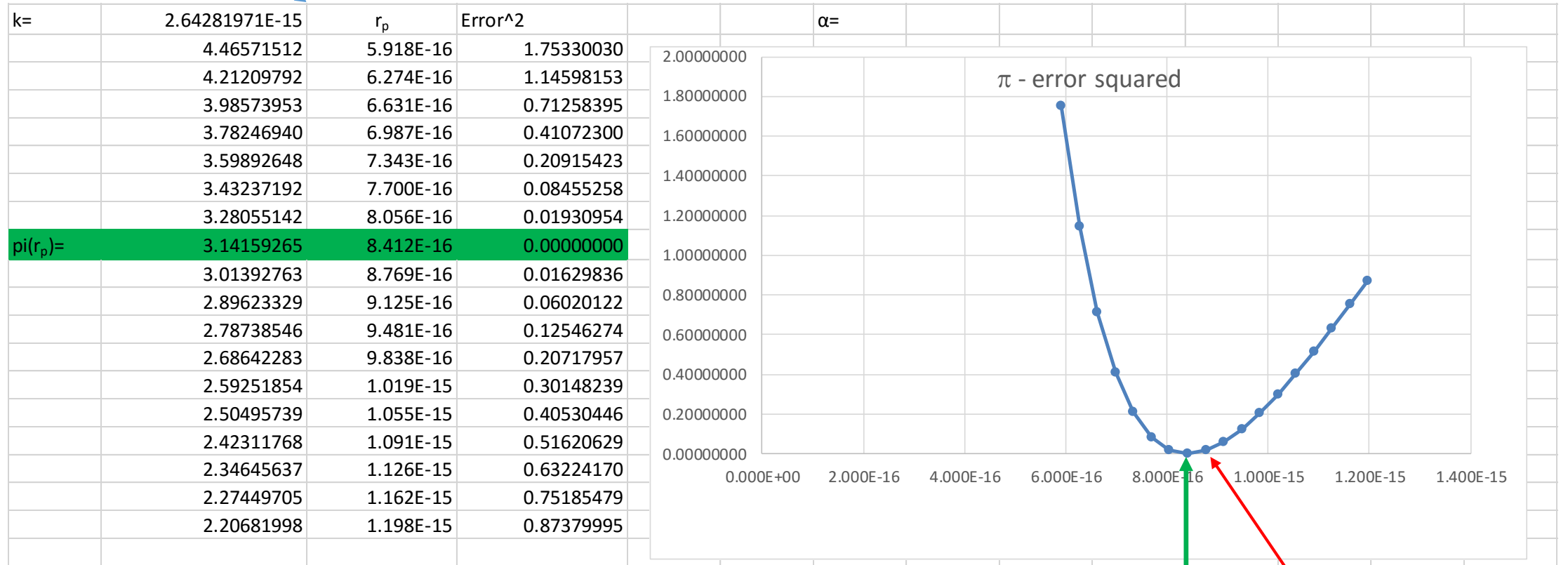
- $r_p = 0.841236 fm$ is required for derived equations to agree with ALREADY established mass measurements!

- Clearly proves equations are correct

- No other equations exist or have been derived until now for the proton to electron mass ratio – many papers written attempting

- Requires completely new whole thinking approach

- Isolated, reductionist approach is incomplete

Relates Six (6) Fundamental Physical Constants

- $\boldsymbol{\mu = \dfrac{m_p}{m_e} = \dfrac{\alpha^2}{\pi r_p R_H} = 1836.15267\ldots}$

- The fine structure constant and the Rydberg constant are among the most accurately measured physical constants

- Can be re-written as a new (possibly expensive) way to calculate π
  - $\pi = \dfrac{m_e \alpha^2}{m_p r_p R_H}$

- $r_p\ must\ equal\ 0.841236 fm$ for these well known constants to work

- Implies a geometrical relationship – significant new approach ADDS to previous mainstream approach – works with it, does not replace it

$$\pi = \frac{m_e \alpha^2}{m_p r_p R_H}$$

Squared error from π vs. proton radius

k=	2.64281971E-15	r_p	Error^2		α=
	4.46571512	5.918E-16	1.75330030		
	4.21209792	6.274E-16	1.14598153		
	3.98573953	6.631E-16	0.71258395		
	3.78246940	6.987E-16	0.41072300		
	3.59892648	7.343E-16	0.20915423		
	3.43237192	7.700E-16	0.08455258		
	3.28055142	8.056E-16	0.01930954		
pi(r_p)=	3.14159265	8.412E-16	0.00000000		
	3.01392763	8.769E-16	0.01629836		
	2.89623329	9.125E-16	0.06020122		
	2.78738546	9.481E-16	0.12546274		
	2.68642283	9.838E-16	0.20717957		
	2.59251854	1.019E-15	0.30148239		
	2.50495739	1.055E-15	0.40530446		
	2.42311768	1.091E-15	0.51620629		
	2.34645637	1.126E-15	0.63224170		
	2.27449705	1.162E-15	0.75185479		
	2.20681998	1.198E-15	0.87379995		

π - error squared

0.8412fm   0.8768fm

Avogadro's Constant

- Using the new proton-electron mass ratio equation, the equation for Avogadro's constant can be re-written

- $$N_A = \frac{A_r(e)M_u\alpha^2}{\pi r_p m_p R_H} = 6.02214129\ldots \times 10^{23}\, per\ mole$$

$A_r(e)$= electron relative atomic mass
M_u= Molar mass constant
α= fine-structure constant
m_p= mass of proton
r_p= muonic hydrogen proton radius of 2010 and 2013 and Haramein's prediction
m_e= mass of electron
R_∞=R_H= Rydberg Constant
ℓ= Planck length
m_ℓ= Planck mass

$$N_A(new) = 6.02214129\ldots \times 10^{23}\ per\ mole$$
$$N_A(old) = 6.022140857(74) \times 10^{23}\ per\ mole$$

MpRp=4LM=ReMe and Torque

$$\mu = \frac{m_p}{m_e} = \frac{\alpha^2}{\pi r_p R_H} = 1836.15267$$

& Planck Mass to Electron Mass Ratio:

$$\nu_1 = \frac{m_\ell}{m_e} = \frac{r_e}{4\ell} = \frac{\alpha^2}{4\pi\ell R_H} = 2.3893048e + 22$$

& Planck Mass to Proton Mass Ratio:

$$\varphi = \frac{m_\ell}{m_p} = \frac{r_p}{4\ell} = 1.30125608e + 19$$

- Everything spins

- Torque equation

α = fine-structure constant
ℓ = Planck ℓength
$r_e = \frac{\alpha^2}{\pi R_\infty}$
r_p = proton radius, 2010 & 2013 muonic hydrogen proton radius
R_H, R_∞ is Rydberg constant

  - $\bar{\tau} = \bar{r} \times \bar{F}$

  - $F = m \times a$

  - $T = \boxed{r \times m} \times a$

- The electron and proton are experiencing the same acceleration, thus the acceleration a cancels and drops from equation

- This relates Haramein's equation to the fundamental ideas he is including in his solution to Einstein's field equations which led to his Unified Physics. Merging Planck's quantum theory with Einstein's General Theory of Relativity.

Ionized Hydrogen Radii – Using Dan Winter's Phi(φ) Equation

- $r = \ell_p \times \varphi^N$
- $r_i = \ell_p \times \varphi^{116} = 0.282527789\text{Å}$
- $r_{ii} = \ell_p \times \varphi^{117} = 0.457139566\text{Å}$
- $r_{iii} = \ell_p \times \varphi^{118} = 0.739667355\text{Å}$

- http://precedings.nature.com/documents/2929/version/1/files/npre20092929-1.pdf

a: Cationic radii

H⁺
0.28

b: Anionic radii

H⁻
0.46

Figure 3. The Golden ratio based radii of hydrogen. d(H+) = B1P = d(HH)/ɸ2 and d(H-) = B2P = d(HH)/ɸ. P is the Golden point on d(HH) = B1B2 **(= 0.74 Å,1 , 0.75 Å,13).**

New Worldview

- Old worldview
  - Disconnected, isolated, reductionist
  - Objects define boundaries of space (space-time)
  - Linear evolution
- New worldview
  - Connected, whole view
  - Space-time defines objects
  - Cyclical

Different Way of Thinking

- Out of the box – there is no box
- 2D Cartesian thinking, 2D physics is incomplete
- Holographic fractal complete
- Requires great courage to go against status quo

Implications

- Energy generation

- Gravitational control

- Different way of relating to environment
  - Restore Earth's ecology
  - Consider all life
  - For the benefit of all to the advantage of none

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Summary

- Vacuum energy density assumption allows for:
  - Calculating mass
  - Developing new equations (proton-electron mass ratio, etc)
  - Enables visualizing space-time dynamics
  - And a whole lot more
- This is simply the beginning of a whole new conceptual way of thinking of science

References

- **Quantum Gravity and the Holographic Mass**, **Haramein, N. (2012). Quantum Gravity and the Holographic Mass, *Physical Review & Research International*, ISSN: 2231-18 15, Page 270-292**
  - http://hiup.org/wp-content/uploads/2013/01/1367405491-Haramein342013PRRI3363.pdf
- See all papers at:
  - http://hiup.org/publications/
- Resonance Academy Delegate Level 1 Program
  - http://academy.resonance.is/
- FractalField.com and Dan Winter's publications

END

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