

HYPOTHESIS

OPEN ACCESS

Full open access to this and thousands of other papers at <http://www.la-press.com>.

The Harmonic Neutron Hypothesis: Derivation of Planck Time and the Newtonian Constant of Gravity from the Subatomic Properties of a Neutron and Hydrogen

Donald William Chakeres

Department of Radiology, The Ohio State University, Columbus, Ohio 43210 USA.
Corresponding author email: donald.chakeres@osumc.edu

Abstract: Planck time (t_p) is derived from subatomic physical constants: frequency equivalents of the neutron, the electron, the Bohr radius, and the ionization energy of hydrogen. t_p squared represents a proportionality constant where the product with the frequency equivalents of two masses and the frequency equivalent distance equals the gravitational energy in Hz. This method is based on the harmonic neutron hypothesis explained herein: the fundamental constants represent a unified exponential consecutive integer (forces) or integer quantum fraction ($1 \pm 1/n$) (particles, bosons, distances) system where the annihilation frequency of the neutron (ν_n) is the base. All of the fundamental constants are associated with simple linear relationships of their components when plotted on a $\ln \ln$ plane using the slopes and intercepts of two $\ln \ln$ plotted lines associated with hydrogen, weak kinetic, wk , and electromagnetic, em . The degenerate, approximate value of t_p^2 can be derived utilizing the quantum fraction values for the proton, 1, gravitational binding energy of electron, -1 , the electron, $6/7$, and the Bohr radius, $4/5$. The approximate degenerate value yielded of t_p is the square root of ν_n raised to the exponent $-1-1-6/7-4/5$ divided by 4π is 5.51548×10^{-44} s, and the known value is 5.39124×10^{-44} s. The predicted degenerate value of Newton's gravitation constant G is $6.9854466 \times 10^{-11} \text{ m}^3 \text{ kg}^{-1} \text{ s}^{-2}$, whereas its known value is $6.67428 \times 10^{-11} \text{ m}^3 \text{ kg}^{-1} \text{ s}^{-2}$. Using the hydrogen line values a more precise prediction can be made beyond what can be measured. Two points define the t_p^2 line, $(0, -b_{wk} - b_{em})$ and $(-1, -a_{wk})$. The intercept of this line at the sum of the quantum fractions $(-128/35 - 1)$ representing t_p^2 is used to derive t_p . The hydrogen line derived t_p value is 5.391141×10^{-44} s. The hydrogen line derived G value is $6.6740402 \times 10^{-11} \text{ m}^3 \text{ kg}^{-1} \text{ s}^{-2}$. These derived values are within the known uncertainties. This method bridges from subatomic properties of hydrogen to gravity unifying these two systems and multiple forces.

Keywords: quantum gravity, Newtonian gravitational constant, neutron, fundamental constants, unification theory, harmonic neutron hypothesis, Planck time

Particle Physics Insights 2011:4 25–31

doi: [10.4137/PPI.S8241](https://doi.org/10.4137/PPI.S8241)

This article is available from <http://www.la-press.com>.

© the author(s), publisher and licensee Libertas Academica Ltd.

This is an open access article. Unrestricted non-commercial use is permitted provided the original work is properly cited.



Introduction

Planck time (t_p) mathematically relates the speed of light (c), Planck's constant (h), and Newtonian gravitational constant (G) to generate a single physical unit of seconds (s), Equation (1).¹⁻⁴ t_p is one of the few fundamental constants that combines quantum, subatomic, relativistic and gravitational fundamental constants in one equation and one unit. In unifying physics models, Planck time is important because it simultaneously relates different forces that are not presently unified. One of the main challenges of theoretical physics today is the unification of subatomic, quantum, relativistic, classical, electroweak, and gravitational phenomena. The goal of this paper is to demonstrate a method that logically derives t_p from subatomic particle constants, without classic gravitational physical constants or methods. These subatomic factors are all plotted on one common geometric plane and are analyzed as a single, coherent, logical system.^{5,6} In this case the gravitational binding energy of the electron in hydrogen is utilized.

t_p is computed by combining many other physical units that cancel out, except for the unit second, Equation (1). t_p is calculated as a square root value, with final units of s . In this paper t_p is computationally evaluated as a function of the square of t_p , with units of s^2 , and not \hbar , but h since frequencies are used for all of the calculations, as reflected in Equations (2–3). Equation (4) solves for G . G and t_p^2 are proportional to each other.

$$t_p = \left[\frac{\hbar}{c^5} G \right]^{\frac{1}{2}} \quad (1)$$

$$t_p = \left[\frac{hG}{c^5} \right]^{\frac{1}{2}} \quad (2)$$

$$t_p^2 = \frac{h}{c^5} G \quad (3)$$

$$G = \frac{c^5}{h} t_p^2 \quad (4)$$

This model evaluates all of the fundamental constants as annihilation frequency equivalents (ν) independent of their primary unit (Tables 1 and 2).^{5,6} As a common valid method in physics, the model evaluates different physical phenomena by changing their unit values to a single normalized unit, Equation (1). In fact, t_p represents a penultimate physical constant that has only one physical unit.

Since this model is based on the unification of subatomic and gravitational forces, the gravitational binding energy of the electron of hydrogen (E_{Gbe}) is the gravitational system evaluated, rather than the ionization energy. In this case the frequency values for the subatomic entities of hydrogen are utilized. These include the frequency equivalents of hydrogen gravitational binding energy, ν_{Gbe} , the mass of the proton, ν_p , the mass of the electron, ν_e , the Bohr radius, ν_{a0} , and the Rydberg constant, ν_R , related to the ionization energy of hydrogen. This non-standard approach is valid, since it allows for the direct correlation of subatomic entities in a gravitational system. The properties of hydrogen, such as the mass of the electron (e), the Bohr radius

Table 1. Constants evaluated classic unit value and their frequency equivalents.

Constant	Known value standard units	ν_k equivalents Hz or s
t_p^2	$1.8260 \times 10^{-86} \text{ s}^2$, no \hbar	$1.8260 \times 10^{-86} \text{ s}^2$
t_p	$1.35138 \times 10^{-43} \text{ s}$, no \hbar	$1.35138 \times 10^{-43} \text{ s}$
Electron binding	$1.922 \times 10^{-57} \text{ J}$	$2.90024 \times 10^{-24} \text{ Hz}$
$h * s$	$6.626069 \times 10^{-34} \text{ J}$	1 Hz
Rydberg	$1.097373156 \times 10^{-10} \text{ m}$	$3.289841960 \times 10^{15} \text{ Hz}$
Bohr radius	$0.52917721 \times 10^{-10} \text{ m}$	$5.6652564 \times 10^{18} \text{ Hz}$
Electron mass	$5.10998910 \times 10^5 \text{ eV}$	$1.2355899 \times 10^{20} \text{ Hz}$
Proton	$938.272013 \times 10^6 \text{ eV}$	$2.2687317 \times 10^{23} \text{ Hz}$
Neutron	$939.56535 \times 10^6 \text{ eV}$	$2.2718591 \times 10^{23} \text{ Hz}$

Notes: This table lists the constants evaluated, classic unit value, and their frequency equivalents. The frequency equivalents are calculated as the annihilation frequencies of the masses and/or the frequencies associated with their wave lengths. The Planck time values are related the no \hbar format in this paper.

Table 2. Principle quantum numbers, exp_k , δ values of the constants evaluated.

Constant	Abbrev.	n	$\pm 1/n$	Sum qf, or qf ($1 \pm 1/n$)	Exp_k (known)	$\delta, \pm (\text{exp}_k - \text{qf}$ or sum) (calculated)
$\text{Log}_{v_{ns}}(1/2)$						-0.012888554
$t_p^2, \text{no } \hbar$				-128/35	-3.6708789	-0.013736073
V_{Gbe}				-1	-1.00775967	-0.00775967
$h * s$	h			0	0	0
Rydberg	R	3	-1/3	2/3	0.66436554	-0.0023011223
Bohr radius	a_0	5	-1/5	4/5	0.80291631	0.0029163104
Electron	e	7	-1/7	6/7	0.86023062	0.0030877599
Proton	p	39043	-1/39043	39043/39044	0.99997438	-2.5613004 $\times 10^{-5}$
Neutron	n	$\pm \infty$	0	1	1	0

Notes: This table lists the known constants evaluated, the abbreviations, the principal quantum number, the quantum fraction (qf), the known exponent (exp_k), and the δ values. The Planck time values are related the no \hbar format. Note that all of the δ values are very small, but not zero as predicted except for h and the neutron.

(a_0), and the ionization energy or Rydberg constant (R), are utilized. The mass of the proton (p) is not used in the derivation of t_p instead, to calculate the known gravitational binding energy of the electron in hydrogen.

Two different methods of derivation are shown. One utilizes an approximate simple degenerate value from quantum fractions.⁵ This demonstrates how the neutron is directly related to t_p . The second method is more precise utilizes a graphical method plotting the values on a ln ln plane identical to previous methods that derived the masses of many fundamental particles, bosons, and the mass of the proton.^{5,6} This method derives the gravitational constants to greater precision than what is measurable.

Methods and Results

All of the constants, independent of units, are converted to annihilation frequency equivalents, Table 1. Since the calculations are related to dimensionless ratios (coupling constants), the actual physical unit is irrelevant. The data used for the calculations were acquired from the following 2011 web site: <http://physics.nist.gov/cuu/Constants/>. The masses are normalized to frequency by multiplying by c^2 , and then, dividing by h . The energies are normalized to frequency by dividing by h . The distances are normalized by dividing the wavelength into the c .

t_p squared, t_p^2 , also represents a proportionality constant that can be used to directly calculate the energy in the units of Hz of a gravitational system

rather than the force from Newton's law of gravity. This derivation is shown below. Equation (5) is the energy of a gravitational system where E_{Gb} is the binding energy, m_1 is one mass, m_2 is the other mass, and λ is the distance separation. Equation (6) solves for G . Equation (7) substitutes the frequency equivalents. Equation (8) simplifies Equation (7). The frequency equivalent of the binding energy is v_{Gb} , one mass frequency equivalent is v_{m1} , the other mass v_{m2} , and frequency equivalent of the separation distance is v_λ . Equation (8) is similar to Equation (4) and both contain the same relationship of c and h . From this it is clear that t_p^2 is related to the ratio of the v_{Gb} divided by the product of v_{m1} , v_{m2} , and v_λ , Equation (9). Equation (10) demonstrates that t_p^2 is a proportionality constant relating v_{Gb} to the product of t_p^2 , v_{m1} , v_{m2} , and v_λ .

$$E_{Gb} = \frac{Gm_1m_2}{\lambda} \quad (5)$$

$$G = \frac{E_{Gb}\lambda}{m_1m_2} \quad (6)$$

$$G = (v_{Gb}h) \left(\frac{c}{v_\lambda} \right) \left(\frac{c^2}{v_{m1}h} \right) \left(\frac{c^2}{v_{m2}h} \right) \quad (7)$$

$$G = \frac{c^5}{h} \frac{v_{Gb}}{v_\lambda v_{m1} v_{m2}} \quad (8)$$



$$t_p^2 = \frac{v_{Gb}}{v_\lambda v_{m1} v_{m2}} \quad (9)$$

$$v_{Gb} = t_p^2 v_{m1} v_{m2} v_\lambda \quad (10)$$

The frequency equivalents v_e , v_p , v_{a0} , and the gravitational binding energy of the electron in hydrogen, v_{Gbe} are substituted into Equation (9). The gravitational binding energy cannot be measured, but it can be calculated from Equation (10) (Tables 1 and 2). Equation (11) substitutes the frequency equivalents of the binding energy components of hydrogen into Equation (9). This is used to derive the Planck time squared.

$$t_p^2 = \frac{v_{Gbe}}{v_{a0} v_e v_p} \quad (11)$$

The neutron hypothesis is that v_n is the fundamental frequency linked to all fundamental constants.⁵ Here, v_n is utilized as a dimensionless number ratio of $v_n s$, or v_n Hz/Hz, and is the numerical unit for computational purposes. The ratio of the known frequency equivalents, v_k , and v_n are evaluated, Equation (12). Thus, the physical unit values are unaffected, Tables (1–3). This is a consecutive integer or integer quantum fraction exponential system, with an exponential domain and a frequency domain. The integer steps are related to the different forces, -1, gravity- binding energy of the electron in hydrogen, 0, electromagnetic, h , and 1, the strong force- the neutron, Equation (13). The quantum fractions, qf, $(1 \pm 1/n)$ values are related to specific physical entities such as energies, distances, masses, Equations (14, 15).^{5,6} This is a classic standing wave

system.⁷ The only possible quantum fractions, qf, are shown in Equation (15). These are the degenerate exponent values.

$$\frac{v_k}{v_n} = (v_n s)^{\text{exp}_k - 1} \quad (12)$$

$$v_k \approx (v_n s)^{\pm n} \quad (13)$$

$$v_k \approx (v_n s)^{\frac{1 \pm 1}{n}} \quad (14)$$

$$qf = 1 \pm \frac{1}{n} \quad (15)$$

The known exponent, exp_k , values are calculated as the ratio of the ln of the known frequency equivalent divided by the ln $v_n s$, Equation (16). Equation (17) shows how the Hz equivalent is calculated from the exponent value. Equation (18) calculates the δ value, the difference between exp_k and the qf. Equation (19) demonstrates the only valid possible x values plotted on the ln ln plane, and these are related to qf-1. The constants are evaluated as dimensionless coupling constants, Equation (12). The qf-1 value is plotted as the x axis value. The y axis value is the δ for each entity. Two points can define a line on the ln ln plane. The natural $\log_{v_n s}$ value is 53.780055612.

$$\text{exp}_k = \frac{\ln(v_k s)}{\ln(v_n s)} = \log_{v_n s}(v_k s) \quad (16)$$

$$v_k = e^{\log_e(v_n s)^{\text{exp}_k}} \text{Hz} = v_n s^{\text{exp}_k} \text{Hz} \quad (17)$$

Table 3. Coupling constant ratios and exponents for the evaluated constants.

Constant	Abbrev.	n	$\pm 1/n$ or sum qf-1	v_k/v_n (known)	$v_n s^{(\pm 1/n)}$ (degenerate)
t_p^2 , no \hbar		(-128-35)/35		8.03851×10^{-110}	
v_{Gbe}		-2	-2	1.276×10^{-47}	1.937×10^{-47}
h^*s	h	-1	-1	4.401681×10^{-24}	4.401681×10^{-24}
Rydberg	R	3	-1/3	1.448083×10^{-8}	1.638851×10^{-8}
Bohr radius	a_0	5	-1/5	2.493665×10^{-5}	2.131688×10^{-5}
Electron	e	7	-1/7	5.438673×10^{-4}	4.606531×10^{-4}
Neutron	n	$\pm \infty$	0	1	1

Notes: Table 3 lists the known constants, the abbreviations, the principal quantum number, the quantum fraction minus one (qf-1), the known ratio values and the degenerate values.

$$\delta = \pm(\exp_k - qf) \quad (18)$$

$$x = \pm \frac{1}{n} = qf - 1 \quad (19)$$

Equation (20) substitutes the quantum fraction values for the proton, 1, an electron, 6/7, the Bohr radius, 4/5, and the binding energy of the electron, -1, into Equation (9). This is utilized to derive the degenerate approximate t_p value, Equation (11). The qf values are substituted into Equation (11) and divided by 2 since this is a kinetic process. The degenerate derived t_p value is 5.51548×10^{-44} s, and the known value is 5.39124×10^{-44} s, Equation (21). The predicted degenerate value of Newton's gravitation constant G is $6.9854466 \times 10^{-11} \text{ m}^3 \text{ kg}^{-1} \text{ s}^{-2}$, whereas its known value is $6.67428 \times 10^{-11} \text{ m}^3 \text{ kg}^{-1} \text{ s}^{-2}$, from Equation (4).

$$t_p^2 = \frac{1}{2} \frac{v_n s^{-1}}{1} \frac{1}{v_n s^1} \frac{1}{v_n s^{6/7}} \frac{1}{v_n s^{4/5}} s^2 \quad (20)$$

$$= \frac{v_n s^{-3.6571428}}{2} s^2 = \frac{1}{2v_n s^{1+1+4/5+6/7}} s^2$$

$$t_p = \sqrt{\frac{1}{4\pi v_n s^{1+1+4/5+6/7}}} s \quad (21)$$

The $\ln \ln$ plane is associated with the exponential and quantum number domain of the constants. These points are described as z points, (x, y) that equal the total value \exp_k minus one, since they are ratio values of $v_n s$ Equation (12). The only valid x values are shown in Equation (19). The minus one centers the neutron at the $(0, 0)$ z point for symmetry. This centering plots the exponents of the coupling constants, and is also the origin of the minus one value in the exponents. Planck's constant is plotted at the z point $(-1, 0)$. These two points are default locations, based on their definitions.

The properties of hydrogen can be defined by two primary logical lines on the $\ln \ln$ plane (Fig. 1) from the hydrogen z points. The first line is described and associated with weak kinetic (wk) properties, and is defined by the z points for the Bohr radius and the mass of the electron. These points are associated with other weak properties such as the muon, and Z boson.^{5,6} The other

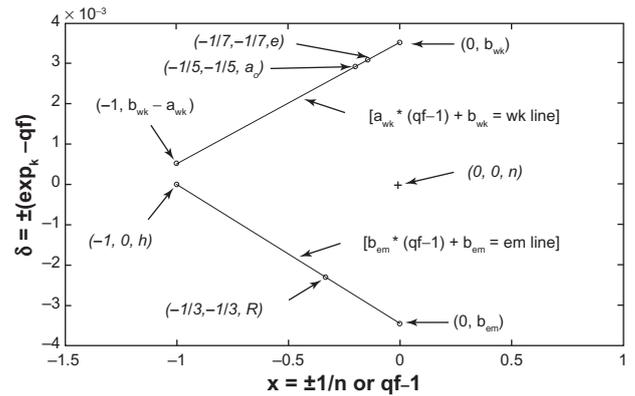


Figure 1. This figure displays the $\ln \ln$ plane and the important translated points (small circles) related to hydrogen including the electron (e), ionization energy (R), and Bohr radius (a_0). The neutron value is at the z point $(0, 0)$, and Planck's constant, h , at z point $(-1, 0)$ by definition. These points define two lines, weak kinetic (wk), and the electromagnetic lines (em). Their slopes and y intercepts are shown. From these three values and qf values t_p^2 is derived in Figure 2.

line, electromagnetic (em) is defined by the z point for Planck's constant at $(-1, 0)$ and the Rydberg constant point (ionization energy). This line is associated with the quarks, pions, and kaons. For the weak kinetic line, the y intercept (b_{wk}) is 3.5163834×10^{-3} and the slope (a_{wk}) is 3.0003654×10^{-3} . For the em line slope, (a_{em}) and (b_{em}) are equal. For the electromagnetic line, (a_{em}) and (b_{em}) both equal $-3.4516836 \times 10^{-3}$.

The z point associated with the known value for t_p^2 was calculated and plotted Table 1 and Figure 2. v_{Gbe} , v_p , v_{a0} , and v_e are respectively the

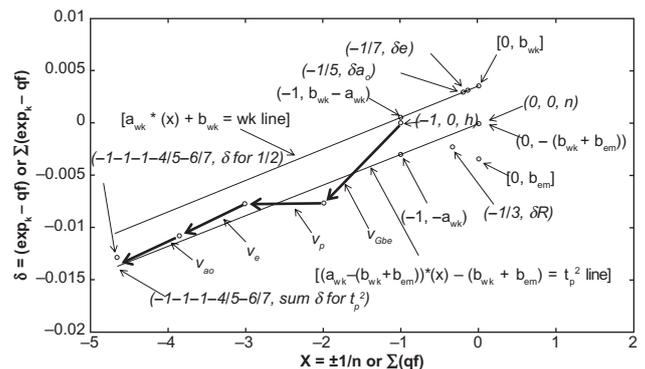


Figure 2. This figure plots the points (open circles) for the subatomic components seen in Figure 1. These points were used to derive the value for t_p^2 directly. The x axis is related to the $qf-1$ values or the sum of these values used for the derivation of t_p^2 . The y axis is the difference between the known value and the degenerate qf or Σqf values. The Σqf associated with the x axis of t_p^2 is at x value of $-1-1-1-4/5-6/7$. The known value of t_p^2 falls on the line connecting the points $[0, -(b_{wk} + b_{em})]$, and $(-1, -a_{wk})$. This line is $[(a_{wk} - (b_{wk} + b_{em})) * \Sigma qf - (b_{wk} + b_{em})]$. **Notes:** This line does intersect the Σqf sum at the known value the t_p^2 δ . The point for δ equal to $1/2$ for t_p^2 is also shown. It is near the known value and represents the degenerate approximation of t_p^2 , Equations (20, 21).



frequency equivalents of the gravitational binding energy, the mass of the proton, the Bohr radius, and the mass of the electron. The known calculated value for ν_{Gbe} is 2.90024×10^{-24} Hz, Equation (10). The \exp_k is -1.0077576 , (Tables 1 and 2).

The sum of the qf associated with t_p^2 is equal to the vector sum $(-1 -1 -4/5 -6/7)$, or -3.657142 . Since the binding energy of the electron is related to the inverse of the annihilation frequency of the neutron, all of the factors are in the denominator and have negative exponent signs, Equation (20). The t_p^2 z point on the ln ln plane is at the x value of $-1-1-1-4/5-6/7$ (-4.657142), since -1 is equivalent to a frequency of 1 Hz (Fig. 2). The known exponent of the t_p^2 is -3.6708789 , and the δ is $-1.3736073 \times 10^{-2}$. This δ is equivalent to 0.477721778 in the time domain, so it is nearly equal to $1/2$. It is related to the sum of the associated four δ values comprising t_p^2 (Table 2). The calculated δ for $1/2$ is -1.288855×10^{-2} , so this is the logical degenerate value for gravity, Equations (20, 21).

The t_p^2 line used for the derivation is defined by the slope, (a), and the y intercept (b); the values of the hydrogen lines follow. One point of the line is defined at the x axis value, 0, and by the y value of the inverse of the sum of the y intercepts of the wk line (b_{wk}) and the em line, (b_{em}), $-(3.5163838 \times 10^{-3} - 3.4516834 \times 10^{-3})$. This point is $(0, -6.4700340 \times 10^{-5})$. The other point is at the Planck's constant x axis value of -1 , and the negative slope of the weak kinetic line, $-a_{wk}$. This point is $(-1, -3.0003654 \times 10^{-3})$. The predictive t_p^2 line is $2.935666 \times 10^{-3} * x - 6.4700340 \times 10^{-5}$. This predicted t_p^2 line intercepts the Σqf vertical line for t_p^2 $(-128/35-1)$ at $-1.37365184 \times 10^{-2}$. The frequency domain of this derived t_p^2 value is $1.8261703 \times 10^{-86}$ s². The known value is 1.8262×10^{-86} s². The relative error is 3.7×10^{-5} , which is well within the known value of 5×10^{-5} . The h Planck time value derived is $1.3513586 \times 10^{-43}$ s. The known h value is 1.35138×10^{-43} s. The routinely derived $\hbar t_p$ value is 5.391141×10^{-44} s, and the known value is 5.39124×10^{-44} s. From Equation (4), G is predicted as $6.6740401 \times 10^{-11}$ m³ kg⁻¹ s⁻², while the known value is 6.6742×10^{-11} m³ kg⁻¹ s⁻². The relative error is 2.4×10^{-5} ; the known relative error is 1.2×10^{-4} .

Discussion

This paper supports the harmonic neutron hypothesis. The fundamental constants as frequency equivalents

follow classic quantum spectral characteristics and are all related to ν_n . These specific values are associated with classic standing integer wave patterns.⁵⁻⁷ By plotting these values on a ln ln plane, the quantum number and linear relationships between individual logically associated constants are obvious. The slope of the t_p^2 line is only slightly less than that for the weak kinetic properties of hydrogen, Figure (1). This is logical since gravity is associated with mass, velocity, and distance. This line is related to the mass of the electron and the Bohr radius. This model can also be used to evaluate other products and other mathematical relationships of many different entities including high energy nuclear, bosons.^{5,6} The general concepts and methods of these different derivations are identical and all utilize solely the values related to the two hydrogen line slopes and intercepts. This method is novel and does not follow the standard methods.

It is remarkable that it is possible to derive the degenerate approximate value of t_p from integers and ν_n alone, Equations (20, 21). The derived value is not perfect, but demonstrates the clear logical connection between ν_n and t_p . This is a prediction of over a power of greater than 10^{110} so this is not a trivial prediction. This value should not be exact.

This model demonstrates the relationship between subatomic quantum and gravitational forces in a unified logical system. Note that the gravity line is centered near the neutron value. This is similar to the character of nuclear properties seen with bosons and other nuclear entities such as Tau or Z⁵.

This model is predicting a value for G and t_p that are beyond what is measurable therefore this hypothesis can be tested with an experimental method. The added precision may be of value for many astrological applications. This precision is related to the fact that only data which are well known are utilized.

The relationships of fundamental constants on the ln ln plane are simple and linear. t_p^2 represents a sum of other subatomic exponents in this model that also demonstrate a similar linear pattern on the ln ln plane linked to the same constants that are seen with hydrogen. This model unifies subatomic quantum constants and the Newtonian gravitational constant via Planck time squared. The neutron hypothesis demonstrates significant unification of the understanding of the origin and nature of the fundamental constants utilizing a perspective of a split classic quantum standing wave system.



Acknowledgements

I would like to thank Amir Abduljalil Ph.D, Mark Ricard Ph.D, and Jane L. Weiss BSN for their help.

Disclosure

Author(s) have provided signed confirmations to the publisher of their compliance with all applicable legal and ethical obligations in respect to declaration of conflicts of interest, funding, authorship and contributorship, and compliance with ethical requirements in respect to treatment of human and animal test subjects. If this article contains identifiable human subject(s) author(s) were required to supply signed patient consent prior to publication. Author(s) have confirmed that the published article is unique and not under consideration nor published by any other

publication and that they have consent to reproduce any copyrighted material. The peer reviewers declared no conflicts of interest.

References

1. Gillies GT. The Newtonian gravitational constant: recent measurements and related studies. *Reports on Progress in Physics*. 1997;60:151–225.
2. Barrow JD. The Constants of Nature: From Alpha to Omega—the Numbers That Encode the Deepest Secrets of the Universe. London: *Vintage*. 2002.
3. Fixler JB, Foster GT, McGuirk JM, Kasevich MA. Atom Interferometer Measurement of the Newtonian Constant of Gravity. *Science*. 2007; 315:7.
4. Ashtekar A. New variables for classical and quantum gravity. *Phys Rev Lett*. 1986;57:2244.
5. Chakeres DW. Harmonic quantum integer relationships of the fundamental particles and bosons. *Particle Physics Insights*. 2009;2:1–20.
6. Chakeres DW. The neutron hypothesis: derivation of the mass of the proton from the frequency equivalents of the neutron, electron, Bohr radius, and the ionization energy of hydrogen. *Particle Physics Insights*. 2011;4:1–5.
7. Benson DJ. *Music: A Mathematical Offering*. Cambridge University Press; 2002.

Publish with Libertas Academica and every scientist working in your field can read your article

“I would like to say that this is the most author-friendly editing process I have experienced in over 150 publications. Thank you most sincerely.”

“The communication between your staff and me has been terrific. Whenever progress is made with the manuscript, I receive notice. Quite honestly, I’ve never had such complete communication with a journal.”

“LA is different, and hopefully represents a kind of scientific publication machinery that removes the hurdles from free flow of scientific thought.”

Your paper will be:

- Available to your entire community free of charge
- Fairly and quickly peer reviewed
- Yours! You retain copyright

<http://www.la-press.com>