

# The Discernible Universe? Absolutely!

## Arguments for a Classical Description of Nature

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Can anyone imagine a skyscraper or a nuclear power plant built without a blueprint? Is our sun nothing more than a glorified nuclear fusion reactor? Do we really believe in what Einstein called “spooky action” at a distance of the Copenhagen interpretation of quantum mechanics? [4]

***“The most wondrous, indisputable concept of the universe is the existence of cognizant beings as offspring of second-generation stars”***

Vito R. D'Angelo

***“Science is the belief in the ignorance of the experts”***

Dr. Richard Feynman, Nobel laureate

Examining the current state of affairs of contemporary high energy particle physics, cosmology and related fields. Today the standard model with two distinct pillars, quantum mechanics and relativity is the torch bearer in our understanding of the universe, from the big bang to the present. Unfortunately, for over a hundred years, the physics establishment has been unable to “marry” the two pillars into a cohesive theory that would resolve the many open issues present in the standard model. The most glaring being the proliferation of fundamental particles, over sixty. Not exactly satisfying as a fundamental model. Another is that the greatest force in the universe, gravity is not incorporated in the standard model. [18]

***“To believe that we cannot discern the universe, is to relinquish our cognizant right to pursue it”*** Vito R. D'Angelo

**The approach taken has been to extrapolate to the beginning of science / mathematics and reexamine:**

What did we miss?

- 1) Democritean unit and Pythagorean ratios, Planck circumference,  $1/e$ ,  $13/12$  Planck mass derivation
- 2) Gravity analogy , proton charge radius prediction
- 3) What's ubiquitous in physics, that we don't understand?  $\pi$

Twenty-five hundred years ago, the philosopher / theorist Democritus proposed to split the stone to an ever smaller and smaller piece, until you get to the indivisible particle. He called it the atom. Today we know that the atom is not the indivisible particle. The electron is much smaller. My contention is that lightest neutrino (formally thought to be massless) is the indivisible particle. Present estimates suggest that the neutrino mass is less than one millionth the mass of the electron. [17 ] My research shows that the indivisible particle mass is equal to the product of the Planck length, elementary charge, and  $\pi$ . [2]

*Indivisible / fundamental / Democritean particle, symbol Y' equation:*

$$Y' = l_p * \pi * e$$

Utrixical theory value:  $Y' = 8.1348651681005514475463894507389 \times 10^{-54}$

where:  $l_p = 1.61618148047550 \times 10^{-35}$  m (Planck length, terminating decimal)

$e = 1.60217651115315018265897 \times 10^{-19}$  C (elementary charge)

$\pi = 3.1415926535897932384626433$  (pi)

$\textcircled{P} = 5.0773838659297066558144945927867 \times 10^{-35}$  m (Planck circumference, new constant)

**Planck circumference,  $\textcircled{P}$**  --- "The first structured grouping", "First pi", "First time". A natural outcome by postulating the value of the inverse elementary charge as the number of Democritean units, Y'. Time is conjoined to the Planck circumference, .i.e., time is structure dependent. No structure, no time. (The National Institute of Standards and Technology, CODATA group, does not list or acknowledge the Planck circumference constant.) [1]  
*Planck circumference - The product of two very well-known constants, the Planck length and pi.*

The calculation of the Planck circumference and the Planck length via the inverse of the elementary charge, utilizing  $\pi$

$$\textcircled{P} = \frac{1}{e} * Y'$$

$$l_p = \frac{\frac{1}{e} * Y'}{\pi}$$

**Postulating the inverse of the elementary charge, i.e.,**

$$\frac{1}{e} = 6.241509553028337757162816786103 \times 10^{18}$$

where:  $e = 1.6021765111531501826556617650347 \times 10^{-19}$  C (elementary charge)

**when multiplied by the indivisible unit  $Y'$**

$$Y' = 8.134865168005514475463894507389 \times 10^{-54}$$

**gives rise to the Planck circumference  $\textcircled{P}$ ,**

$$\textcircled{P} = 5.0773838659297066558144945927867 \times 10^{-35} \text{ m}$$

**when divided by  $\pi$ ,**

$$\pi = 3.1415926535897932384626433832795$$

**gives rise to the Planck length,**

$$l_p = 1.61618148047550 \times 10^{-35} \text{ m}$$

a rational , terminating decimal (within the (NIST) 2010 CODATA value:  $1.616199(97) \times 10^{-35}$  m

*Equations of the Planck length(National Institute of Standards and Technology)*

$$l_p = \hbar/mpc = (\hbar G/c^3)^{1/2}$$

(NIST) 2018 CODATA value:  $1.616255 (18) \times 10^{-35}$  m [1]

**The inverse of the elementary charge,  $\frac{1}{e}$ .** It is hard to imagine (albeit true) that the inverse of such a profound entity (elementary charge), would have no significance in the contemporary framework of fundamental physics. Utrixical theory defines *the function of the inverse of the elementary charge as the number of fundamental /Democritean units,  $Y'$ , that gives rise to the Planck circumference.* Providing a sequential connectedness to the constants. (see: hierarchical equation) [11 ]the calculation of the Planck circumference; semantic scholar)

$$\frac{1}{e} = \frac{\textcircled{P}}{Y'}$$

**Inverses** --- The inverse of a constant is not an isolated entity, but rather an intrinsic part of its definition. Akin to a coin, where the heads and tails sides are both part of the same entity. And both sides having a contribution to its meaning.

$\pi$  --- In the thirty-five hundred years since its discovery, [2] physicists have been unable to give pi a definable function within the context of fundamental equations. It has been stated in simple generic terms, i.e., the ratio of a circle's circumference to its diameter, period. [2] The author posits the first application of pi to structure --- the Planck circumference,  $\textcircled{P}$ . Utrixical theory gives  $\pi$  a fundamental double function: 1) the advent of structure. 2) the advent of time Therefore, time is structure dependent.

**First pi, equation:**

$$\pi = \frac{\textcircled{P}}{lp}$$

**Fundamental equations utilizing  $\pi$ :**

$\hbar = h/2\pi$  (reduced Planck constant)

$\alpha = e^2/4\pi\epsilon_0\hbar c$  (fine-structure constant)

$G_{\mu\nu} = 8\pi T_{\mu\nu}$  (Einstein's gravity field equation) [8]

## Gravity

The function of the collective charge pressure of Y' units, (assumption,1c) as an attribute of gravity (dark energy). The cosmic force emanating from what is thought to be empty space. Perhaps I can best describe it with an analogy: The collective charge pressure as shrink wrap. Now let's shrink wrap the earth and moon as a unit. But, before doing so, let us smear petroleum jelly all around earth, allowing it to rotate. What we find is, that the earth is almost entirely constricted --- except at the point where the earth and moon are at their closest points. Given that they were shrink wrapped as a unit, a funnel formed, where there was no pressure from the plastic wrap (at the earth-moon closest points). Now, as the earth rotates and the ocean comes in the funnel area, where there is no containment (by the shrink wrap), the ocean bulges out --- Voila' the tides! Finally an acceptable description of the tides. Where we do not have to invoke Newton's crazy instantaneous attraction of the moon. Nor, Einstein's curvature of space-time, which never made sense when applied to the tides. Mind you, this is a simple analogy, a more sophisticated analogy would involve shrink wrapping the entire solar system (actually the universe) . [16]

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### Planck mass

$$m_p = \frac{2\pi \left[ \frac{(\frac{1}{2})\hbar}{\phi} \right]}{c}$$

$$m_p = 2 * \pi * 1.038499006 / 299792458 = 2.176532972 \times 10^{-8} \text{ kg}$$

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Note: within the 2018 (NIST) CODATA value:  $2.176434 (24) \times 10^{-8} \text{ kg}$

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The NIST lists the Planck mass equation (standard model) as:  $m_p = (\hbar c/G)^{1/2}$  [1]

**Planck mass, mp**

NIST 2014 CODATA value:  $2.176470 (51) \times 10^{-8}$

NIST 2006 CODATA value:  $2.17644 (11) \times 10^{-8}$

U-theory value:  $2.1765329732 \times 10^{-8}$

	Proton mass
$m_p$	$1.672503106 \times 10^{-27}$
$m_p/m_e$	1836.022569
	Electron mass
$m_e$	$9.109382065 \times 10^{-31}$
$\alpha^{-1}$	137.0359996
	New Constant 4
$NC_4$	$6.647437236^{-33}$
$NCR_3$	10.03224887
	Planck constant
$h$	$6.626068909 \times 10^{-34}$
$2\pi$	6.283185307
	Red. Planck const.
$\hbar$	$1.054571620 \times 10^{-34}$
2	2
	$\frac{1}{2}$ Red. Planck const.
$\frac{1}{2}\hbar$	$5.272858100 \times 10^{-35}$
$\frac{1}{2}\hbar/\textcircled{P}$	1.038499006
	Planck circumference
$\textcircled{P}$	$5.077383865 \times 10^{-35}$
$\pi$	3.141592654
	Planck length
$l_p$	$1.616181480 \times 10^{-35}$
$c$	299792458
	Planck time
$t_p$	$5.391001321 \times 10^{-44}$
$c$	299792458
	New constant 3
$NC_3$	$1.798244414 \times 10^{-52}$
$NCR_2$	10.5007114
	New constant 2
$NC_2$	$1.712497702 \times 10^{-53}$
2	2
	New constant 1
$NC_1$	$8.562488511 \times 10^{-54}$
$NCR_1$	1.05256674
	Democritean unit
$Y'$	$8.134865168 \times 10^{-54}$

2	6.
	5
*	2
1.038	5
	0
*	8
$\pi$	1
	6
	9
	6

$\div \boxed{c} = m_p = 2.1765329732 \times 10^{-8}$

**For the first time in history, the theoretical enumeration of a constant has been achieved. In a paper titled “ The calculation of the Planck circumference and the Planck length via the inverse of the elementary charge, utilizing pi ” Written on May 11, 2015 Vixra: 1505.0090.**

**On May 20, 2019 NIST replaced the 2014 CODATA value of the proton rms charge radius of 0.8751 (61) fm to 0.8414 (19) fm. [1] Almost Exactly the value predicted by Utrixical Theory (0.84129 fm) four years earlier [11]**

The proton charge radius conundrum

*In July of 2010, Dr. Pohl et al published the results of an experiment measuring the proton rms charge radius. The experiment entailed using a muon (200 times heavier) instead of an electron to probe the proton. The results show the proton radius [0.84184(67) fm] to be smaller by a factor of five, beyond the CODATA value [0.8768(69) fm] of acceptable uncertainty limits. The physics community is not embracing Dr. Pohl’s results. To do so, would mean that the sacrosanct theory of quantum electrodynamics has at least some aspect that is not so sacrosanct. The consensus is that there is an error in the calculations. [11][12][13]*

*In February of 2013, two-and-a-half years later, Dr. Antognini et al (co-authors of the first paper) performed a new measurement, using for the first time laser spectroscopy of muonic hydrogen. The results were in good agreement with the 2010 value, but 1.7 times as precise, [0.84087(39) fm]. Therefore, the smaller value of the proton charge radius has been reaffirmed. The consensus is starting to shift in considering new physics beyond the standard model or challenging the present understanding of quantum electrodynamics (QED).[10][14][15]*

*My contention is that the muonic experimental results of Drs. Pohl, Antognini et al are correct; based on Utrixical theory’s ability to theoretically enumerate the proton radius [0.84129 fm] and related constants (based on first principles).*

***Utrixical theory prediction: As a consequence of a smaller proton radius, the associated constants, such as, the proton mass, proton/electron ratio, etc., will manifest their values proportionally smaller.***

## *Enumeration of the proton rms radius and related constants*

### **Proton rms charge radius**

$r_p$

2010 CODATA value: 0.8775(51) fm [1]

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Dr. Pohl's value: 0.84184(67) fm

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Dr. Antognini's value: 0.84087(39) fm

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Utrixical theory value: 0.841295246681... fm

$$r_p = \frac{8}{[m_e/\textcircled{P}](m_p/m_e)[c/[(1/2)\hbar/\textcircled{P}]]} = \frac{4\hbar}{m_p c}$$

Please note: the second equation describes the proton charge radius as 4 units of the reduced Planck constant divided by the proton mass multiplied by the speed of light. Assuming a 4% smaller proton mass value.

where:  $m_e = 9.109382065 \times 10^{-31}$  kg (electron mass)

$\textcircled{P} = l_p * \pi = Y' / e = 5.077383865 \times 10^{-35}$  m (Planck circumference)

$l_p = 1.61618148047549 \times 10^{-35}$  m (Planck length)

$\pi = 3.141592654$

$m_p = 1.672503107 \times 10^{-27}$  (proton mass, assumed and by extension, 4% smaller value)

$c = 299792458$  m s<sup>-1</sup> (speed of light)

$\hbar = h/2\pi = 1.05457162 \times 10^{-34}$  J s (reduced Planck constant)

$Y' = 8.134865168 \times 10^{-54}$  C (fundamental charge / the only hypothetical in Utrixical theory)

$e = 1.602176511 \times 10^{-19}$  C (elementary charge)

subset of new constants (ratios):

$[m_e/\textcircled{P}] = 17941.093890$  (electron / Planck circumference ratio)

$[m_p/m_e] = 1836.02256891$  (proton mass - electron mass ratio)

$[1/2\hbar / \textcircled{P}] = 1.038499006$  (ratio of attribute)

$[c/[1/2\hbar / \textcircled{P}]] = 288678618.1$



*“The three pound brain – the greatest physics lab in the universe”*

*Vito R. D’Angelo*

**Please note: this paper is comprised of snippets of Utrixical Theory, a finite fundamental particle grouping theory. Which is still being finalized. The reader can get background information by google, Vixra archive Vito D’Angelo, physics. Important papers: The calculation of the Planck circumference constant; 13/12 Schematic ; Pythagorean ratios; Planckian hierarchical schematic; Resolving the quantum paradox of 720 degrees rotation, Massive Sterile Neutrino**

## **References**

- [1] CODATA group, National Institute of Standards and Technology '06,'10,'14,'18
- [2] David Blatner, The Joy of  $\pi$ , Walker and Company, USA
- [3] John D. Barrow, The Constants, Pantheon Books, USA (2002)
- [4] Jim Baggott, The Quantum Story, Oxford University Press, New York (2011)
- [5] Kenneth W. Ford, The Quantum World, Harvard University Press, USA (2004)
- [6] Richard P. Feynman, QED, Princeton University Press, USA (1985)
- [7] Lee Smolin, The Trouble With Physics, First Mariner Books, USA (2007)
- [8] Albert Einstein, Relativity, Crown Publishers, Inc. USA
- [9] Antognini, A. et al. Science 339, 417-420 (2013)
- [10] Pohl, R. et al. Nature 466, 213-216 (2010)
- [11] Vito R. D’Angelo, Planck circumference, Vixra: 1505.0090, May 11, 2015
- [12] Science Daily, Proton Size Puzzle, Jan. 24, 2013
- [13] Vito R. D’Angelo, 13/12 schematic, Vixra: 1607.0172, July 14, 2016
- [14] Jim Al-Khalili, Quantum, Weidenfeld & Nicolson, U. K., 2003
- [15] Reviews of modern physics, Volume 84, October-December 2012
- [16] Encyclopedia of Science and Technology, 5<sup>th</sup> edition (1987)
- [17] APS news, frontiers of subatomic physics, volume 28, 4/2019
- [18] Braibant, Giacomelli and Spurio, Particles and Fundamental Interactions 2009