A NEW NEUTRINO MASS HYPOTHESIS

ABSTRACT

We start by realizing that Newton's classical gravitational constant, G, and the quantum gravitational-structure constant (using h instead of h-bar for accuracy) must be made equivalent. Doing this assigns specific numerical values for the units: gram (gm), centimeter (cm) and second (sec) - - something physics considers absolutely impossible to do! We hypothesize 1 neutrino to be exactly 1 gm X 1 cm/1 sec - - a momentum - - which amounts to approximately 10^{-10} sec - - a reasonable quantum time interval. The neutrino is thus hypothesized to be A PARTICLE OF TIME! Time is physical. We hypothesize the neutrino mass to be 1 gm X 1 cm/time (sec)/the same amount of time (sec) - - specifically, exactly gmcm/sec^2 - - a force (in enormous numbers) - - =(cm/sec^2)gm - - a mass! This turns out to be approximately 10^{-34} gm. That is a very testable result, at least in approximation. Initial estimates are very favorable to our hypothesis, but delicate, precise experiments currently underway and/or future experiments will either confirm or disprove our hypothesis.

INTRODUCTION

This article has been introduced to produce mass for a subatomic particle out of the vacuum.[1] For the longest time, this particle was not found; more recently, it has been found in particle accelerators.[2]

We begin with a couple of points pertaining to gravity. The gravitational constant, G, is an interesting constant in the sense that many particle physicists claim that it is not fundamental.[3] If this is the case, gravity must be thought of as a quantum-mechanical field.[4] If so, an identification with the fine-structure constant of electromagnetism can be made.

The goal of this paper is to establish a connection between the fine-structure constant of electromagnetism and the gravitational constant. And we shall see an interesting consequence which arises from this connection: we will be able to calculate the possible mass of the neutrino with great exactitude.

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[1] Weinberg, S., The Discovery of Subatomic Particles; Revised(2003) Cambridge, U.K.:Cambridge University Press, pp.2-3

[2] Close, F. ,Neutrino; (2010), N.Y., N.Y.:Oxford University Press, p.7

[3]Narlikar, J.V., Cosmologies with Variable Gravitational Constant; Foundations of Physics, Vol.13, #3, (1983)pp.311-323

[4] Schroer, B.; European Physical Journal(2013) Issue #35:377; The Einstein-Jordan Conundrum and its Relation to Ongoing Foundational Research in Local Quantum Physics; SpringerLink

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By Jonathan Deutsch

There exists only one strength of gravity, not two, at any one time. Physics, however, posits two: a classical strength of gravity - - Newton's G - - and a quantum strength of gravity - - Gm_{proton}^2/hc (h is more accurate than h-bar here.)[5] Therefore, we must mathematically equate G, or 6.6728674 X 10^{-8} $cm^3/gmsec^2$, and Gm_{proton}^2/hc, or .9397908 X 10^{-39} dimensionless. Gm_{proton}^2/hc is clearly analogous to the fine-structure constant of electromagnetism: e^2/h-bar c.[6] The latter represents the relative strength of the electromagnetic force; the former, that of the gravitational force. This is at first glance most surprising, but not really. If G is not truly fundamental, then gravity must be viewed as a quantum-mechanical field. Note the h in Gm_{proton}^2/hc. Gm_{proton}^2/hc, as stated, must equal G. Obviously, the only way to equate the two is to quantize spacetime and mass - - i.e., assign numerical values to units - - a task that physics considers ABSOLUTELY IMPOSSIBLE! But 6.6728674 X 10^{-8} $cm^3/gmsec^2$ CAN be made to mathematically equal .9397908 (actually, .9397907) X 10^{-39} dimensionless, but ONLY IF we set:

1) m_{proton} (=1.6726216 X 10^{-24} gm) equal to exactly 1;
2) the de Broglie λ_{proton} (=$h/m_{proton}c$ = 1.3214098 X 10^{-13} cm) equal to exactly –1; and
3) t_{proton} (=λ_{proton}/c = 4.4077486 X 10^{-24} sec) equal to exactly $\sqrt{-1}$.

Then numerical values can easily be assigned to the three units - - gm, cm and sec:

1) gm=5.9786385 X 10^{23} m_{proton} = 5.9786385 X 10^{23} dimensionless;
2) cm=.7567675 X 10^{13} λ_{proton} = –.7567675 X 10^{13} dimensionless; and
3) sec=2.2687319 X 10^{23} t_{proton} (=2.2687318 X 10^{23} $\sqrt{-1}$ dimensionless).

Therefore, m_{proton} = 1, λ_{proton} = –1 and t_{proton} = $\sqrt{-1}$ are all real facts of nature!

In the 1930's, physicist Wolfgang Pauli described a theoretical particle which MUST exist and which MUST possess the following six properties:

1) it steals off with some of the energy;
2) it's invisible;
3) it has no electric charge;

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[5] Barrow, J.D., (1991) Theories of Everything; N.Y., N.Y., Oxford University Press; p.93
[6] Barrow, J.D., (1991) Theories of Everything; N.Y.,N.Y., Oxford University Press; p.93

4) it has at most a very minute, if not zero, mass;
5) it exists and steals energy right under our nose and yet escapes detection;
6) its activities can properly be called “nefarious”.

What an unusual particle! What is the only entity in the entire universe that possesses all SIX of these properties? The shocking answer is: TIME!

1) TIME steals some of our energy - - more and more as time goes on;
2) TIME is invisible;
3) TIME has no electric charge;
4) TIME has literally or virtually zero mass;
5) TIME exists and steals our energy right under our nose and yet escapes detection.
6) TIME’s activities are very often “nefarious” indeed.

Could a neutrino, therefore, somehow really be A PARTICLE OF TIME? If so, time is physical! Could nature really be like this -- - with an almost infinite number of particles of time? We hypothesize a neutrino to be equal to exactly:
1 gm X 1 cm/1 sec. Calculating using the protonic values for gm, cm and sec yields the result that a neutrino is exactly .8790193 X 10^{-10} sec! 10^{-10} sec is a known, plausible time interval for a quantum particle - - what a neutrino IS, in its essence, NOT its lifetime, which is forever, as far as we know.

Now we want to go from neutrino to neutrino mass - - i.e., from time to mass. m_{proton}=1=…an amount of time/the very same amount of time=…sec/sec. Therefore, we hypothesize a neutrino’s mass to be (gmcm/sec)/sec = gmcm/sec^2 - - a force, not a mass. But by The Associative Law, gmcm/sec^2 = (cm/sec^2) gm - - a mass! Calculating, again using the protonic values for gm, cm and sec, we obtain a value for the neutrino mass of exactly 1.4702666 X 10^{-34} gm. This result is very testable experimentally, at least approximately. Initial current estimates give a possible value of between 10^{-33} gm and 10^{-35} gm; 10^{-34} gm lies right in the middle of this range! Experiments are currently underway which will either confirm or disprove our hypothesis.

CLOSING PARAGRAPH

In conclusion, we want to emphasize that the mass of quantum particles SHOULD in principle be calculable. Our theory fully allows this to occur for the neutrino. The proton is used throughout this paper because only the proton yields the correct figure of 10^{-39} as the quantum strength of gravity.

Any comments or questions may be directed to the author at spqrpeartree@aol.com. All will be answered promptly.

REFERENCES

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2) Close, F. ,Neutrino; (2010), N.Y., N.Y.:Oxford University Press, p.7
3) Narlikar, J.V., Cosmologies with Variable Gravitational Constant; Foundations of Physics, Vol.13, #3, (1983)pp.311-323
4) Schroer, B.; European Physical Journal(2013) Issue #35:377; The Einstein-Jordan Conundrum and its Relation to Ongoing Foundational Research in Local Quantum Physics; SpringerLink
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6) Barrow, J.D., (1991) Theories of Everything; N.Y.,N.Y., Oxford University Press; p.93