

# Reconciling General Relativity with Quantum Mechanics

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## Abstract

*There has been a crisis in theory regarding Quantum Mechanics and General Relativity. Here I propose a solution by saying that there is a flexible framework to the structure of the universe and that this is essentially the structure of the vacuum energy.*

## I. INTRODUCTION

Essentially the problem is defined by the metric  $G_{\mu\nu} = R_{\mu\nu} - 1/2Rg_{\mu\nu} = (8\pi G)/c^4 T_{\mu\nu}$  and for the vacuum we have  $R_{\mu\nu} = 0$  The issue is basically reconciling Quantum Mechanics with  $\lim_{\mu\nu \rightarrow \infty} G_{\mu\nu}$  That is that space needs to be continuous.

$$\Delta x \Delta p \geq h/2$$

The fact that the density of virtual particles will create its own field.

That information should be lost in black holes according to General Relativity but that it will be conserved in Quantum Mechanics. These I believe can be reconciled by the statement that: The vacuum energy has a structure. This is such that it is of the Cartesian axes and this produces Octahedrons that can completely fill space. These essentially are the building blocks of the universe. (Insert figure 1) At the origin of each of these 'fields' is a mathematical singularity. This is useful in the study of black holes as when mass/energy is incident upon the fields they contract as  $E = 1/x$ . Thus for black holes the branches (the arms of the axes) contract to the singularity at the centre. The problem of a mass of virtual particles in gravity is solved by the notion that the fields contract with mass thus contracting neighbouring fields

out to infinity (albeit very weak far away).

This is essentially the same as the curvature  $R_{\mu\nu}$  of spacetime as the fields are curved. The fields curve spacetime and spacetime curves the fields.

This may also explain the 10 dimensions in Super string theory as there are 6 dimensions in the fields (one for each branch) and 4 for spacetime.

The fact that the fields are interacting with energy/information means that black holes conserve information in that the fields preserve their states.

One problem is determining the size of the fields to satisfy the uncertainty principle  $\Delta x \Delta p \geq h/2$  further because of the mathematical analogy of Cartesian Axes supplying the structure of the fields, this means that the fields, perhaps, can calculate variables in their very geometry. This is essentially a code. This may explain entanglement as what is necessary is the 'key' to the code contained within the fields. This information is contained both within spacetime and the particles themselves. The singularities at the centre of the fields may be a type of antennae which code/decode information upon them.

To summarise in explaining how giving the vacuum energy structure we can say that the curvature of spacetime and the nature of quan-

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\*A thank you or further information

tum interactions can be explained by the fact that there is a pervasive network of structures that relate to energy and information yet are also flexible in the nature of spacetime.

These fields are perfect transmitters and should not provide a reference frame due to their transitional/ uniform nature. The continuity of spacetime can be preserved by noting that within the axes are a length of continuous interval.

#### REFERENCES

- [Figueredo and Wolf, 2009] Figueredo, A. J. and Wolf, P. S. A. (2009). Assortative pairing and life history strategy - a cross-cultural study. *Human Nature*, 20:317–330.