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From Neutrino Masses to the Full Size of the Universe - Some Intriguing Aspects of the Tetron Model

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The universe according to the tetron model consists of invisible tiny constituents, elastically bound with bond length about the Planck length and binding energy the Planck energy.

A tetron transforms as the fundamental fermion(=octonion) representation 8 of $SO(6,1)$. With respect to the decomposition $SO(6,1) \rightarrow SO(3,1) \times SO(3)$ a tetron possesses spin 1/2 and isospin 1/2, i.e. it represents an isospin doublet of Dirac spinors.

The 24 known quarks and leptons arise as eigenmode excitations of a tetrahedral fiber structure, which is made up from 4 tetrons and extends into 3 additional 'internal' dimensions.

While the laws of gravity are due to the elastic properties of the tetron bonds, particle physics interactions take place within the internal fibers.

I will concentrate on two of the most intriguing features of the model:

-understanding small neutrino masses from the conservation of isospin, and, more in general, calculating the spectrum of quark and lepton masses. This is obtained from the tetron model's interpretation of the Higgs mechanism.

-the possibility to determine the full size of the universe from future dark energy measurements. This is obtained from the tetron model's interpretation of the dark energy phenomenon.

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