Higgs-saw Mechanism

Brass, copper, sterling silver, nickel silver, titanium

5.5cm x 3xm x 1 cm

Higgs-saw Mechanism **Image © Green Vale Gallery**

Inspiration:

Professor Lawrence M Krauss

A recent (2013) paper by Lawrence M Krauss and James Dent describes a "Higgs-Saw Mechanism as Source for Dark Energy". It notes that the concept is "motivated by the see-saw mechanism for neutrinos and is a small GUT scale mixing between the Standard Model Higgs and an otherwise massless hidden sector scalar". It focuses on particle physics and a quest to "generate a vacuum energy density as minute as that needed to produce the Dark Energy required to drive the current accelerated expansion of the universe"[1].

Materials:

Brass balance scales (donated), titanium (donated), sterling silver

Method:

Components of the brass balance scales were cleaned and adjusted to make a balance point for a see-saw mechanism. A piece of titanium was cut into a disc, formed into a shallow dish, coloured with heat (oxide layer), then riveted with silver to the original copper pins of the balance. Similarly, a disc of sterling silver was cut, formed and riveted to the other side. The piece was burnished to bring the metals up to a high shine.

Results:

The physics behind this concept is deep - and beyond the comprehension of many. By making a model of something that hasn't yet been developed, I'm hoping my interpretation of the "Higgs-Saw Mechanism" will provoke discussion. Does it accurately portray the ruminations presented in the paper (the titanium dish represents Dark Energy) or is it completely off? – either way, this visualisation may help to continue the conversation that has begun...

The box is made of salvaged timbers - the lid, an Australian native, Red Cedar (*Toona ciliata*) and the base, Olive (*Olea europaea*) salvaged from the SA Botanic Gardens. Made for Labpunk and the AIP Congress 2014 by Gary Field.

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[1] Krauss, L M & Dent, J B, 2013. A Higgs-Saw Mechanism as a Source for Dark Energy. *Phys. Rev. Lett.* 111, 061802. Retrieved from http://arxiv.org/pdf/1306.3239v1.pdf