

**WHAT SCIENTIFIC IDEA IS READY FOR RETIREMENT?**

**The Higgs (God's?) Particle Closes a Chapter? No Way.**

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The discovery of the Higgs particle (aka God's Particle, aka "the Goddamn particle", according to Leon Lederman) allegedly closes the chapter of establishing the Standard Model of particle physics, or at least so we read in the newspapers and in the announcements from Stockholm. The introduction of this idea, five decades ago, was indeed an important landmark in the development of the standard model. But, in reality, it does not answer any of the remaining open questions, which have now been plaguing the model for more than thirty years. Nature has taught us that everything (not really; what about the dark matter and dark energy?) is made of six types of quarks (why six?) and six types of leptons (why six and why the same number?). They are arranged in a very clear pattern, which replicates itself (why?) three times (why three?) in a precise manner. These dozen types of particles have positive or negative electric charges of exactly 0,1,2 or 3 units in multiples of one third of the electron charge (why always only these charges, no others, and why quark charges are even related to lepton charges?). The particle masses can be described only by approximately 20 free parameters, unrelated to each other, appearing to be taken from the results of some bizarre cosmic lottery, ranging over almost 10 orders of magnitude. Yes, the Higgs concept gives us a tantalizing mechanism by which these particles obtain a mass and are not massless. But this is what creates the problem. Why these masses? Who selected these numbers and why? Can it be that all of physics and, indeed, all of science, are based on creating all of matter in the universe from a dozen objects with totally random mass values, while no one has the faintest idea about their origin? These mysterious mass values allegedly reflect the strength in which the Higgs particle "couples" to the quarks and leptons. But that is like saying that the weights of a dozen people reflect the fact that, when they step on the scale, these numbers appear there. Not a very satisfying explanation. The true puzzle of the standard model is, as always in physics, "what next?" Something must lie beyond it, solving the puzzle of the dark matter, dark energy, particle masses and their very simple, distinct and repetitive systematic pattern. The Higgs particle contributes absolutely nothing to the solution of these puzzles, unless the final answer is that the Higgs particle is indeed God's particle and it is God's will that the particle masses are these and no others. Or, perhaps, it is not one God, but a dozen gods with diverse numerical tastes. The good news is that we still have some exciting discoveries ahead of us, deciphering the basic structure of all of matter, beyond the temporary picture offered by the standard model. We certainly do not yet have a theory of everything, not even close.