

Garret Lisi

Lisi is known for "An Exceptionally Simple Theory of Everything," a paper proposing a unified field theory based on the E8 Lie group, combining particle physics with Einstein's theory of gravitation. The theory is incomplete and not widely accepted by the physics community.

The Exceptionally Simple Theory of Everything, which proposes a unified field theory combining a grand unification theory of particle physics with Albert Einstein's general relativistic description of gravitation, using the largest simple exceptional Lie algebra, E8. In a paper posted to the physics arXiv on November 6, 2007, and in a popular article published in Scientific American in December, 2010, Lisi describes his proposal that gravity, the standard model bosons and fermions can be unified as parts of an E8 superconnection. This unified field theory attempts to describe all fundamental interactions observed in nature, as a possible theory of everything, unifying Albert Einstein's general relativity with the standard model of particle physics. The theory, called E8 Theory, also predicts the existence of many new particles.[28]

Lisi designed a web application, the Elementary Particle Explorer,[29] for visualizing the charge structure of the elementary particles in the standard model, in grand unified theories, and in E8 Theory.

Lisi's theory has been applauded but also criticized in the scientific community. [

http://en.wikipedia.org/wiki/Antony_Garrett_Lisi

"An Exceptionally Simple Theory of Everything"[1] is a physics preprint proposing a basis for a unified field theory, very often referred to as "E8 Theory,"[2] which attempts to describe all known fundamental interactions in physics and to stand as a possible theory of everything. The paper was posted to the physics arXiv by Antony Garrett Lisi on November 6, 2007, and was not submitted to a peer-reviewed scientific journal.[3] The title is a pun on the algebra used, the Lie algebra of the largest "simple", "exceptional" Lie group, E8. The paper's goal is to describe how the combined structure and dynamics of all gravitational and Standard Model particle fields, including fermions, are part of the E8 Lie algebra.[2] In the paper, Lisi states that all three generations of fermions do not directly embed in E8 with correct quantum numbers and spins, but that they might be described via a triality transformation, noting that

the theory is incomplete and that a correct description of the relationship between triality and generations, if it exists, awaits a better understanding.

The theory received accolades from a few physicists[citation needed] amid a flurry of media coverage, but also met with widespread skepticism.[4] Scientific American reported in March 2008 that the theory was being "largely but not entirely ignored" by the mainstream physics community, with a few physicists picking up the work to develop it further.[5]

In a follow-up paper, Lee Smolin proposes a spontaneous symmetry breaking mechanism for obtaining the classical action in Lisi's model, and speculates on the path to its quantization.[6]

In July 2009 Jacques Distler and Skip Garibaldi published a critical paper in Communications in Mathematical Physics called "There is no 'Theory of Everything' inside E8," arguing that Lisi's theory, and a large class of related models, cannot work. They offer a direct proof that it is impossible to embed all three generations of fermions in E8, or to obtain even the one-generation Standard Model without the presence of an antigeneration. In response to Distler and Garibaldi's paper, Lisi argues, in a new paper "An Explicit Embedding of Gravity and the Standard Model in E8," peer reviewed and published in a conference proceedings, that some assumptions about fermion embeddings are unnecessary and that the antigeneration is not per se a problem sufficient to rule out the one-generation Standard Model. In December 2010 and May 2011, Lisi wrote in the popular magazine Scientific American a feature article on the E8 Theory of Everything and an entry in the blog section of the magazine addressing some of the criticism of his theory and how it has progressed, noting that the theory is still incomplete and makes only tenuous predictions, with the three generation issue remaining as a significant problem.

http://en.wikipedia.org/wiki/An_Exceptionally_Simple_Theory_of_Everything

A comment by one of our Anonymous readers last week invited me to read the Wikipedia article called "An Exceptionally Simple Theory of Everything," which concerns a physical theory of everything (TOE) recently proposed by Garrett Lisi et. al. Naturally, the similarity between the title of that theory and the Simple Explanation's title piqued my curiosity. I have now read the Wiki article and have also followed and read various html links leading out from that article. While I don't pretend to understand all of the physics, from what I can tell so far, their theory is possibly compatible with the Simple Explanation's toroidal model.

<http://asimpleexplanation.blogspot.com/2011/07/lis-exceptionally-simple-theory-of.html>