

# SEMINAR IN PHYSICS

FRIDAY, April 10, 2015

3:30-4:25 · Ross 0220

~ Refreshments! ~

## **The Quantum-Relativity Problem**

Derek Weigle (UNC Physics student)

Quantum Mechanics and Relativity are both widely accepted theories, each experimentally proven many times. However, these two theories are limited to certain “domains” -- Quantum mechanics involving the very small, and Relativity the very large. For many years, one of the biggest problems in physics has been trying to unite the two theories. This has been unsuccessful due to many facts, one of the most frustrating being that relativity breaks down when applied to very small, quantum domains where space-time is far from the smooth, curved surface that relativity predicts. String Theory, a model that suggests that the smallest, most elementary particles in the universe are tiny vibrating strings, may help solve this puzzle. Due to the fact that these strings are different than point particles, it could possibly make these tiny fluctuations in space-time irrelevant.

## **The Higgs Boson**

Dan Hefty (UNC Physics student)

In 1964 theoretical physicist Peter Higgs proposed a missing piece to the Standard Model puzzle. The Standard Model is the theory of all of the fundamental particles that make up matter and how they interact. These interactions, from our understanding, is how the world around us was created. The Higgs Boson is the missing piece believed to be the cornerstone to the Standard Model. Now more than just an idea thanks to the particle physicists at CERN, they have found evidence of the “God Particle”: The particle that gives all things mass.