CU Physics Department Particle Seminar

Wednesday, April 30, 2008 705 Pupin Hall 1:00 PM

The Quest for the SM Higgs

The Standard Model predicts the existence of one final particle, the Higgs Boson, which is the physical manifestation of spontaneous symmetry breaking as a mechanism for electroweak symmetry breaking, and is responsible for the masses of the known gauge bosons. Without the Higgs, the Standard Model is certainly incorrect or at least incomplete. We are at a precipice in the study of particle physics today because the answer to the question of the existence of the Higgs is about to be revealed. Constraints from precision LEP electroweak data indicate that the Higgs is light, making it within reach of observation by modern high energy particle colliders. I will discuss the state-of-the-art searches for the Standard Model Higgs Boson at the Tevatron and the plans for searches at the LHC. In particular, I will highlight the search techniques that are relevant at each collider and how Higgs searches at the LHC can benefit from knowledge acquired at the Tevatron.

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