

CU Physics Department Colloquium

Monday, October 18, 2010 4:10 PM 428 Pupin Hall

ELECTROWEAK SYMMETRY BREAKING: THE START OF A NEW ERA?

The Standard Model of Particle Physics has been tested to exquisite precision over the past three decades. Nevertheless, the nature of the physics responsible for the breaking of the electroweak symmetry remains unknown. This most basic issue is expected to be fully or partially uncovered during the LHC era. It is also possible that "the physics of the TeV scale" carries answers to other fundamental questions, such as the origin of the observed flavor structure, the identity of dark matter, or the origin of the baryon asymmetry of the universe. Furthermore, theoretical research has determined that, in spite of the impressive quantitative tests (at the quantum level) of the basic standard model framework, there can be radical departures at the TeV scale, such as the existence of additional spatial dimensions that can be observable at the LHC. I will review how our present knowledge has led us to suspect that the EW scale may provide important clues regarding even smaller scales, and exemplify the possibilities for physics beyond the standard model in the energy regime we are currently exploring in collider experiments.

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