Gemeinsame Veranstaltung von
Humboldt-Universität zu Berlin, Institut für Physik
(Theorie der Elementarteilchen / Computerorientierte Theoretische Physik)
DESY, Zeuthen

SEMINAR
Feldtheorie auf dem Gitter und Phänomenologie der Elementarteilchen

Am Mittwoch, dem **7. Juli 2010, um 11:00 Uhr s.t.** spricht

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zum Thema

From CP Violation to Electroweak Symmetry Breaking - a 4G Saga

Abstract

It is known that the CP violation from Kobayashi-Maskawa mechanism with 3 generations of quarks fall short of the Sakharov conditions for baryogenesis by orders of magnitude. We point out that merely moving to 4 generations (4G), the CPV seem to be sufficient, through the large 4G Yukawa couplings. This observation started with the thread of the direct CPV difference "anomaly" in $B \to K\pi$ decays. Correlations within 4G between Z-penguin and box diagrams, lead to the anticipation of sizable time-dependent CPV in $B_s \to J/\psi\phi$, where the sign was predicted. The current experimental status is volatile, which can only be settled by LHCb. Mass limits from direct search for t' and b' at the Tevatron is approaching 350 GeV, and with the expected 1 fb^{-1} data at 7 TeV, by 2012 the bounds from LHC may reach 500 GeV, starting to touch the unitarity bound. This brings about the old notion whether large Yukawa couplings could lead to heavy QQ(bar) condensation, thereby being the source of electroweak symmetry breaking. Whether this theoretical concern, or the practical concern of experimental search beyond 500 GeV, a new platform needs to be set up to study the Higgs-Yukawa sector on the lattice. In a few years time, the discovery of new heavy chiral quarks may shed light on both baryogenesis and electroweak symmetry breaking, two of the biggest problems of our time.

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