



LHC Seminar

SPEAKER: Roman Kogler (Hamburg University (DE))
TITLE: **Search for new resonances with boosted signatures at CMS**
DATE: Tue 23/06/2015 11:00
PLACE: Council Chamber

ABSTRACT

The discovery of a Higgs boson at the LHC marks a milestone in particle physics. With this scalar particle, the Standard Model is complete and internally consistent. However, questions like the validity of the theory up to high scales, the large quantum corrections to the mass of the Higgs boson and the role of gravity are still unanswered and leave room for speculations. Various extensions of the Standard Model addressing these questions, like theories with extra dimensions or a composite Higgs sector, predict heavy resonances at the TeV scale, which couple predominantly to the Higgs and electroweak gauge bosons and to top and bottom quarks.

The LHC and its experiments are ideally suited to search for these new resonances in order to validate or constrain the corresponding theories. At resonance masses well above 1 TeV, these searches face specific challenges. The decay products have large Lorentz boosts, resulting in very collimated final state topologies. Jet substructure methods and the use of non-isolated leptons are crucial for increased sensitivity over traditional search methods at high resonance masses.

In this talk an overview is given of the experimental methods used for these searches in CMS. The various possible final states, from multi-leptonic to entirely-hadronic, are discussed together with the experimental strategies used in the searches. A summary of the experimental results from the Run 1 of the LHC is given. The talk concludes with an outlook on the performance of jet substructure algorithms in CMS for Run 2 of the LHC.

Organised by: C. Lourenco, G. Unal..... **Tea and Coffee
will be served at 10h30**